KHOJ-2025
Exam for
Young Scientists..!

SCHOLARSHIPS up to ₹5 Crore
SCHOLARSHIP FOR HIGH ACHIEVERS
AND NEEDY STUDENTS

SCIENCE APTITUDE TEST

CLASS - 7

SOLUTIONS

TEST CODE - 12

WhatsApp Channel

Result will be Declared on 14th Oct. 2025

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PART - I : MENTAL ABILITY

1.

Sol. (c) C is facing West → C sits on the East side (faces West). C's right = North → D sits at North (thus D faces South). B is partner of D → B sits opposite D (South position) and faces North.

2.

Sol. (d) Delhi is city

3.

Sol. (a) Let's analyze the coding for TRAIN → RPYGL:

T (20) → R (18) : - 2

R (18) → P (16) : - 2

A (1) → Y (25) : + 24 (or -2 mod 26)

I (9) → G (7) : - 2

N (14) → L (12) : - 2

All letters shifted by -2 positions in the alphabet.

Apply the same to SCOOTER:

S(19) - 2 = Q(17)

C(3) - 2 = A(1)

O(15) - 2 = M(13)

O(15) - 2 = M(13)

T(20) - 2 = R(18)

E(5) - 2 = C(3)

R(18) - 2 = P(16)

Code for SCOOTER is QAMMRCP

4.

Sol. (d) Damage, Demand, Destroy, Dia-mond.

5.

Sol. (c) Check each 5 with its immediate neighbours; the 5's at positions (0-based) 5, 9, 11 have even numbers on both sides → total 3.

6.

Sol. (b) If Mohan is 23rd from both ends, total people = 23 + 23 - 1 = 45.

7.

Sol. (b) Replace: X = +, Y = -, P = ×. So 10 P 2 X 5 Y 5 = 10 × 2 + 5 - 5 = 20 + 5 - 5 = 20.

8.

Sol. (c) **50**

9.

Sol. (a) pattern: For abc → write a^2, then b (as is), then c^2 (concatenate).

Examples: 213

→ 4 1 9 = 419; 415

→ 16 1 25 = 16125. So 215

→ 4 1 25 = 4125.

10.

Sol. (a) Moon : Satellite :: Earth : Planet (Moon is a satellite; Earth is a planet).

11.

Sol. (c) Map sequence given: white → red, red → yellow, yellow → orange, orange → blue, blue → violet, violet → green. Brinjal (eggplant) colour = violet, and violet maps to green.

12.

Sol. (c) Gaps increase as +3, +4, +5, +6 ...

A → D (+3), D → H (+4), H → M (+5), M → S (+6), S → Z (+7).

13.

Sol. (a) Grandfather's only son = Father of Ramesh. → Boy is son of father = brother.

14.

Sol. (a) Leaf is part of tree, Page is part of book.

15.

Sol. (b) A = 1, C =3, E = 5 → 1 + 3 + 5 = 9

PART - II : MATHEMATICS

1.

Sol. (b)

$$\left(x^2+\frac{1}{x^2}\right)=\left(x-\frac{1}{x}\right)^2+2=(5)^2+2=25+2=27$$

2.

Sol. (a) 4.4 cm →

Area of circle = 1.54

$\pi r^2 = 1.54$

$\frac{22}{7}.r^2 = 1.54$

$r^2 = \frac{1.54\times 7}{22} = 0.07\times 7$

r = 0.7 cm

Circumference

⇒ $2\pi r = 2 \times \frac{22}{7} \times 0.7 = 4.4cm$

3.

Sol. (b) 30 cm²

→ ½ × 10 × 6 = 30

4.

Sol. (a) 9/7

→ reciprocal = multiplicative inverse

5.

Sol. (b) 30%

Profit = 15, CP = 50

→ Profit% = 15/50 × 100

= 30% (Wait check)

⇒ CP = 50, SP = 65 → Profit = 15

⇒ Profit% = (15/50) × 100 = 30%

⇒ Correct answer (b) 30%**

6.

Sol. (b) **360**

Loss 10% → SP = 90% of 400 = 360

7.

Sol. (a) 25%

Profit = 200, CP = 800

→ 200/800 × 100 = 25%

8.

Sol. (b) **50**

25% of 200 = 50

9.

Sol. (b) 4:1

2 hrs = 120 mins → 120:30 = 4:1

10.

Sol. (b) Rs 60

5 pencils = 25→ 1 pencil

= 5→ 12 pencils = 60

11.

Sol. (b) 7

(4 + 6 + 8 + 10)/4 = 28/4 = 7

12.

Sol. (b) 1 + 0.1 + 0.01 + 0.001 = 1.111

13.

Sol. (a) **5²**

$5^2 = 5 \times 5 = 25$

$2^5 = 2 \times 2 \times 2 \times 2 \times 2 = 32$

$5^2 < 2^5$

(∵ 25 < 32)

14.

Sol. (b) $5\frac{1}{2}-3\frac{2}{3}+7\frac{1}{5}-6\frac{1}{4}$

$$=5-3+7-6+\frac{1}{2}-\frac{2}{3}+\frac{1}{5}-\frac{1}{4}=2\frac{47}{60}$$

15.

Sol. (b) $\frac{1}{8} < \frac{4}{7} < \frac{2}{3} < \frac{7}{9} < \frac{5}{6}$

16.

Sol. (a)

There is only one line can be dream passing through tow given point

17.

Sol: (b) Area of rectangle = 15 × 5 = 75

Rectangle divided into theree equal parts

$\Rightarrow$ Area of $1\ cm^2 = \frac{75}{3} = 25$

$\Rightarrow$ $Side^2 = 25$

$\Rightarrow$ Side = 5

18.

Sol. (a) Peri of square = $\frac{32}{4} = 8cm$

Area of square = $8^2 = 64\ cm^2$

19.

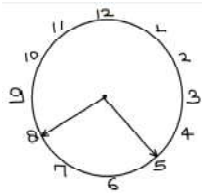
Sol. (c) Area of square = $3 \times 3 = 9m^2 = 9000\ cm^2$

Area of 1 marble slab = 20 cm × 30 cm

$\therefore$ No of slabs = $\frac{300 \times 300}{20 \times 30} = 150$

20.

Sol. (c)



21.

Sol. (c) We are given: $l \parallel m$.

Relation: 2x = y.

In parallel-line geometry problems, x and y are usually co-interior / supplementary angles.

So, $x + 2y = 180°$

Also given: y=2x

Substitute

$x + 2(2x) = 180$

$5x = 180$

$x = 36°$

Find y

$y = 2x = 2 \times 36° = 72°$

So the solution is : $x = 36°, y = 72°$

22.

Sol. (c) Present age = x years

Age of 5 years ago = (x - 5)years

23.

Sol. (c) Working hr = 10 : 30 AM to 5 : 30 PM

$= 7\ hr = 7 \times 60 = 420\ min$

Lunch = 30 min

Office hour : lunch time

420 : 30

14 : 1

24.

Sol. (c) Water : Milk

3 : 1

$3 \times 4 : 1 \times 4$

12 : 4

25.

Sol. **(d)**

a : b = c : d

$a \times d = b \times c$

26.

Sol. (c) 5 : 120 : : 40 : x

$x = \frac{120 \times 40}{5} = 960$

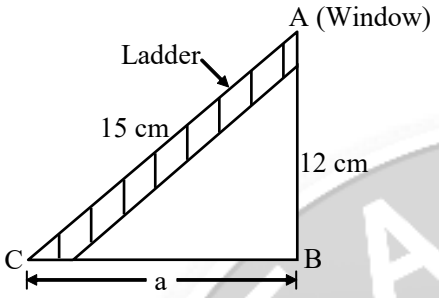
27.

Sol. (d) Tuesday

28.

Sol. (a) 9 m

In ΔABC, using Pythagoras theorem, we get



$AC^2 = AB^2 + BC^2$

$15^2 = 12^2 + BC^2$

$225 = 144 + BC^2$

$225 - 144 = BC^2$

$81 = BC^2$

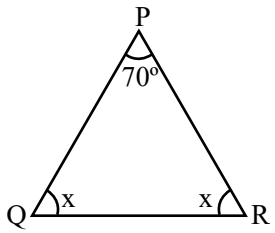
$9^2 = BC^2$

$\Rightarrow$ BC = 9 m i.e., a = 9 m

29.

Sol. (b) 55°

Let PQR be a triangle such that :



$\angle P = 70°$ and $\angle Q = \angle R = x$ (let)

As $\angle P + \angle Q + \angle R = 180°$

(angle sum property of Δ)

$70° + x + x = 180°$

$2x = 180° - 70°$

$2x = 110°$

$x = \frac{110°}{2}$

$x = 55°$

So, measure of each of remaining two angles is 55°.

30.

Sol: (c) 4.0 °F

= The rose remperature of human body $(102.6 - 98.6)\ ^0F = 4.0^0F$

PART - III : PHYSICS & CHEMISTRY

1.

Sol. (c) Concave mirror

- Concave mirrors can produce a magnified, upright image when the object is close. (between focus and pole of the mirror)
- That's why barbers use concave mirrors for shaving.

2.

Sol. (d) Vacuum

- Sound is a mechanical wave, it needs a medium (solid, liquid, gas) to vibrate particles.
- In vacuum, there are no particles, so sound cannot travel.

3.

Sol. (c) 2500 m²

- 1 km = 1000 m $\Rightarrow$ 1 km² = (1000 × 1000) m² = 10^6 m².
- So, 0.0025 km² = 0.0025 × 10^6 = 2500 m².

4.

Sol. (c) Newton

- Joule, Erg, Calorie are units of energy.
- Newton = unit of force (not energy).

5.

Sol. (c) Lever

- A lever can reduce effort force (mechanical advantage) but the distance moved by load decreases.

6.

Sol. (a) 5 km

- Distance = 4 + 3 = 7 km.
- Displacement = shortest path

= $\sqrt{(4^2+3^2)} = \sqrt{25} = 5$ km.

7.

Sol. (a) 3600 s

- 1 hour = 60 minutes.
- 1 min = 60 seconds

$\Rightarrow$ 1 hour = 60 × 60 = 3600 s.

8.

Sol. (b) Newton

- Force = mass × acceleration (F = ma).
- SI unit: kg•m/s² = Newton (N).

Dyne is the C.G.S unit of force.

9.

Sol. (b) Gravitational force

- Whether going up or coming down, Earth's gravity always pulls the ball downward.

10.

Sol. (c) 36 km/h

- Conversion: 1 m/s = $\frac{\frac{1}{1000}\text{km}}{\frac{1}{60\times60}\text{h}} = \frac{3600}{1000}\text{km/h}$ = 3.6 km/h.
- So, 10 × 3.6 = 36 km/h.

11.

Sol. (c) Camphor sublimates on heating, so sublimation separates it from sand.

12.

Sol: (b) Butter/cream separates from milk by centrifugation (spinning).

13.

Sol. (b) Salt dissolves to form ions which conduct electricity.

14.

Sol. (c) Sugar is a pure compound with fixed composition.

15.

Sol. (c) Symbol of Boron is B (single capital letter).

16.

Sol. (c) Ice is less dense than water, so it floats.

17.

Sol. (c) Candle burning
= wax melts (physical) + wax burns (chemical).

18.

Sol. (c) CH_3COOH is a weak acid because it ionizes partially.

19.

Sol. (c) Common salt is NaCl (sodium chloride).

20.

Sol. (c) Curdling of milk forms new substances, so it is chemical change.

PART - IV : BIOLOGY

1.

Sol. (c) Stomata

Stomata are small pores on leaf surfaces that help in exchange of gases and transpiration.

2.

Sol. (d) None

3.

Sol. (b) Algae

Algae contain chlorophyll and perform photosynthesis.

4.

Sol. (a) Egestion

Egestion is the elimination of undigested food; digestion is breakdown, absorption is intake by cells.

5.

Sol. (c) Pseudopodia

Amoeba uses finger-like extensions of cytoplasm called pseudopodia to engulf food.

6.

Sol. (c) Kidney

Kidneys filter nitrogenous wastes (urea) from blood.

7.

Sol. (c) Lion

Ruminants chew cud; Lion is carnivorous and not a ruminant.

8.

Sol. (b) Transpiration

Plants lose water through stomata in the process of transpiration.

9.

Sol. (c) Photosynthesis

Photosynthesis uses sunlight, CO_2, and water to produce glucose and oxygen.

10.

Sol. (b) Platelets

Platelets release clotting factors that help in clot formation.