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SCIENCE APTITUDE TEST

CLASS - 9

SOLUTIONS

TEST CODE - 12

WhatsApp Channel

Result will be Declared on 14th Oct. 2025

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PART - I : MENTAL ABILITY

1.

Sol. (d) Stuti's position: 13th from top

Barkha's position: 25th from bottom

Total participants: 75

To find the number of participants between Stuti and Barkha:

First, find Barkha's position from the top: Barkha is 25th from the bottom, so from the top:

= Total – 25 + 1 = 75 – 25 + 1 = 51st from the top

Number of participants between Stuti (13th) and Barkha (51st): 51 – 13 – 1 = 37

So, the answer is 37.

2.

Sol. (a) F(6) + R(18) = 24

A(1) + E(5) = 6

T(20) + H(18)= 28

COUSIN = 17 24 40

3.

Sol. (c) [a] $66 = 27 - 13 \times 3 \Rightarrow 66 \neq -12$

[b] $66 \times 27 = 13 - 3 \Rightarrow 1782 \neq 10$

[c] $66 - 27 = 13 \times 3 \neq 39 = 39$

[d] $66 - 27 \times 13 = 3 \Rightarrow -285 \neq 3$

4.

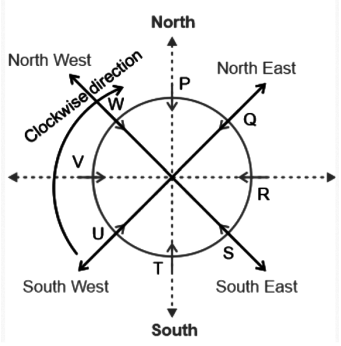
Sol. (b) 294 – 252 = 210 – 252 = 168 – 210 = 42

326 – 273 = 220 – 273 = 167 – 220 = 53

126 is right answer.

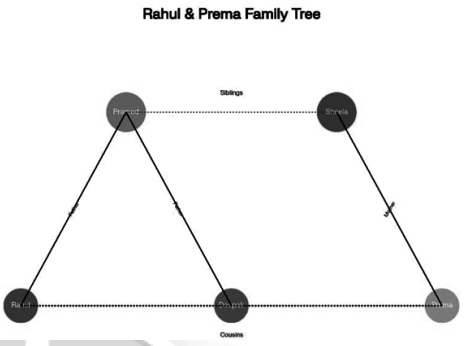
5.

Sol. (d)



6.

Sol. (b)



Here is the flowchart showing the relationship between Rahul and Prema based on the given family details. It starts with Rahul and Deepak as brothers, Pramod as their father, Sheela as Pramod's sister, Prema as Pramod's niece, and concludes that Rahul and Prema are cousins.

7.

Sol. (c) There are 12 squares in the figure.

8.

Sol. (b) Option – (b) is right answer.

9.

Sol. (b) Tooth is odd one out from the given numbers.

10.

Sol. (d) 45° – 270° + 135° = 180 – 270 = – 90

90° from East to clockwise direction = South

11.

Sol. (d) There are 4 fours (6 are there) which are immediately preceded by 5 but not followed by 7.

12

Sol. (c) Correct Answer: 3. 900

Given :

CAT + CAT + CAT=RAT

If C=3, A =0, R = 9

Logic :

$\Rightarrow$ 30T + 30T + 30T = 90T

$\Rightarrow$ CAT + CAT + CAT = RAT

The possible value of T = 0, then 300 + 300 + 300 = 900

$\Rightarrow$ 900 = 900

If T = 1

$\Rightarrow$ $301 + 301 + 301 \neq 901$

$\Rightarrow$ $903 \neq 901$

Here, the possible value of T = 0 as per logic

Hence, the correct answer is '900".

13.

Sol. (b) Missing Number Question 2 Detailed Solution

The pattern followed here is:

In the first column,

$(5)^3 - (3)^3 = 125 - 27 = 98$

In the third column,

$(8)^3 - (6)^3 = 512 - 216 = 296$

Similarly, in the second column,

$(4)^3 – (?)^3 = 63$

$\Rightarrow$ $64 – (?)^3 = 63$

$\Rightarrow$ $(?)^3 = 64 - 63$

$\Rightarrow$ $(?)^3 = 1$

14.

Sol. (b) The logical sequence is –

Point, Straight line, Angle, Triangle, Rectangle

15.

Sol. (c) BOMB $\rightarrow$ @8H@

LIFE $\rightarrow$ %.6$5

MOBILE $\rightarrow$ #8@6%5

PART - II : MATHEMATICS

1.

Sol. (b) 60 cm²

Side of square = 2 cm

Area of small square = 4 cm²

Required area = $10 \times 4 + \frac{1}{2} \times 4 \times 10$

= 40 + 20 = 60 cm²

2.

Sol. (a) 161

Average Height

$= \frac{50 \times 160 + 60 \times 162}{50 + 60}$

$= 161.09 \approx 161$ cm

3.

Sol. (b) $\sqrt{11} > \sqrt{6}$

$A = \sqrt{17} - \sqrt{12}$, $B = \sqrt{11} - \sqrt{6}$

Rationalize each difference by multiplying numerator and denominator by the conjugate:

$A = \sqrt{17} - \sqrt{12} = \frac{17-12}{\sqrt{17} + \sqrt{12}} = \frac{5}{\sqrt{17} + \sqrt{12}}$

$B = \sqrt{11} - \sqrt{6} = \frac{11 - 6}{\sqrt{11} + \sqrt{6}} = \frac{5}{\sqrt{11} + \sqrt{6}}$

Both numerators are the same positive number “5“5.

So the larger value corresponds to the smaller denominator. Compare the denominators:

$\sqrt{17} + \sqrt{12}$ vs $\sqrt{11} - \sqrt{6}$

Since square-root is increasing and

$17 > 11, 12 > 6$

$\Rightarrow$ $\sqrt{17} > \sqrt{11}$ and $\sqrt{12} > \sqrt{6}$

Adding gives:

$\sqrt{17} + \sqrt{12} > \sqrt{11} + \sqrt{6}$

Thus the denominator of A is larger than the denominator of B. So

$A < B \Rightarrow \frac{5}{\sqrt{17} + \sqrt{12}} < \frac{5}{\sqrt{11} + \sqrt{6}}$

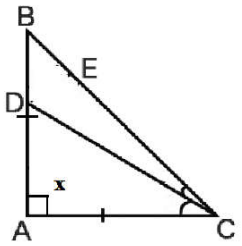
Therefore the greater number is

$\sqrt{11} - \sqrt{6}$ is greater.

4.

Sol. (c) 67.5

In the triangle:



AB = AC

$\angle C = 45°$

Also, $\angle 1 = \angle 2 = \frac{45}{2} = 22.5°$

Hence, $\angle ADC = 90° - 22.5° = 67.5$

5.

Sol. (b) $x + y + z = 180^0$

$$\frac{4}{3}y + y + z = 180^0$$

$$\frac{7}{3}y + z = 180^0$$

$$\frac{7}{3}\left(\frac{3}{8}z\right) + z = 180^0$$

$$\frac{7}{8}z + z = 180^0$$

$$y = \frac{3}{8} \times 96 = 36^0$$

$$\frac{15z}{8} = 180^0$$

$$x = \frac{4}{3}y = \frac{4}{3} \times 36 = 48^0$$

$z = 96^0$

$x = 48^0$, $y = 36^0$

6.

Sol. (a) $\angle AFE = \angle FAB = 65^0$

$\angle ACD + \angle CAB = 180^0$

$\angle CAB = 35^0$

Hence $x = 65^0 - 35^0 = 30^0$

7.

Sol. (b) Statement-1: Lower class limit

= Mid value $-\frac{1}{2}$ (width of class interval)

$$= 90 - \frac{1}{2} \times 20 = 90 - 10 = 80$$

Statement-2 Class marks

$$= \frac{50 + 70}{2} = \frac{120}{2} = 60$$

8.

Sol. (c) $\text{Probability} = \frac{\text{No. Of Successful outcomes}}{\text{Total no. outcomes}}$

$$\text{Probability} = \frac{23 + 28}{100} = \frac{51}{100}$$

9.

Sol. (d) Every natural number is a real number.

10.

Sol. (c) AB = AC = 3x

BC = 2x

Perimeter = 32 cm

8x = 32

$\therefore \quad x = \frac{32}{8} = 4\text{cm}$

AB = AC = 3x = 12 cm

BC = 2x = 8 cm

$$S = \frac{32}{2} = 16$$

$\therefore \quad \text{Area} = \sqrt{s(s-a)(s-b)(s-c)}$

$$= \sqrt{16(16-12)(16-12)(16-8)}$$

$$= 32\sqrt{2}\text{cm}^2$$

11.

Sol. (a) BD = 48m

$$OD = \frac{48}{2} = 24cm$$

In ΔAOD,

$OA^2 + OD^2 = AD^2$

$\Rightarrow$ $OA^2 + 24^2 = 40^2$ $\Rightarrow$ $OA^2 + 576 = 1600$

$\Rightarrow$ $OA^2 = 1024$ $\Rightarrow$ OA = 32 cm

AC = 64 cm

Hence Area $= \frac{1}{2} \times d_1 \times d_2$

$$= \frac{1}{2} \times 48 \times 64 = 1536m^2$$

12.

Sol. (a) y = 700 + 25x

-25x + y = 700

13

Sol. (c)

14.

Sol. (c) Probability of guring $= \frac{1-2}{3}$

$$P(E) + P(\overline{E}) = 1$$

$\Rightarrow$ $\frac{x}{2} = \frac{1}{3}$ $x = \frac{2}{3}$

$$-P(\overline{E}) = 1 - P(E)$$

$$\frac{2}{3} = 1 - \frac{x}{2}$$

$$\frac{x}{2} = 1 - \frac{2}{3} = \frac{2}{3}$$

15.

Sol. (d) Volume of cuboid = 27 × 8 × 1

Volume of cube = 27 × 8 × 1

Side = $\sqrt[3]{216}$ = 6 cm

Surface area of cuboid = $2(lb + bh + hl)$

= 2(27 × 8 + 8 × 1 + 1 × 27)

= 2(216 + 8 + 27)

= 2 × 251

= 502 cm^2

Surface area of cube

= $6a^2 = 6(6)^2 = 216\ cm^2$

Required difference

= 502 – 216 = 286 cm^2

16.

Sol. (b) We have,

$(a + b)(ab)(a^2-ab+b^2)(a^2 + ab + b^2)$

= $(a+b)(a^2-ab+b^2)(ab)(a^2 + ab + b^2)$

= $(a^3 + b^3)(a^3-b^3) = (a^3)^2 - (b^3)^2 = a^6 - b^6$

17.

Sol. (b) Maximum area = Equilateral Triangle

Perimeter = 36cm

Side =12 cm

$\therefore$ Area $= \frac{\sqrt{3}}{4} \times side^2 = 36\sqrt{3}\ cm^2$

18.

Sol. (c) Area $= \frac{1}{2}(a+b) \times h = 1188$

$\Rightarrow$ $\frac{1}{2}(a+b) \times 18 = 1188$

$\therefore$ a + b = 132 cm

19.

Sol. (d) Quantity of tea in 1 cup = $\pi r^2 h$

$$= \frac{22}{7} \times \frac{7}{2} \times \frac{7}{2} \times 4 = 11 \times 7 \times 2 = 154$$

Quantity in 180 cup = 180×154

$= 27720cm^3 = 27.72$ litres

20.

Sol. (d) Area = 0.64π

$\pi r^2 = 0.64\pi$

r = 0.8m

No. of revolutions = $\frac{\text{Total distance}}{\text{Circumference}}$

$$= \frac{1.408km}{2\pi r} = \frac{1.408 \times 1000}{2 \times \frac{22}{7} \times 0.8} = 280$$

21.

Sol. (d) Given, $\angle PQR = 150°$

Reflex $\angle POR = 2\angle PQR = 2(150°) = 300°$

Now, $\angle POR = 360° -$ Reflex $\angle POR$

$= 360°-300° = 60°$

Also, OP = OR $\Rightarrow \angle OPR = \angle ORP$

(Angles opposite to equal sides of a triangle are equal)

In $\angle OPR$, $\angle OPR + \angle ORP + \angle POR = 180°$

$2\angle OPR + 60° = 180°$ [From (i) & (ii)]

$2\angle OPR = 120°$ $\Rightarrow \angle OPR = 60°$

22.

Sol. (b)

23.

Sol. (a) $S = \frac{a+b+c}{2} = \frac{13+15+14}{2} = 2$ inch

$\therefore$ Area$= \sqrt{s(s-a)(s-b)(s-c)}$

$= \sqrt{21(21-13)(21-15)(21-14)}$

$= \sqrt{21\times 8\times 6\times 7}$

= 84 Square inches

24

Sol. (a) A - B = 60

B - C = 15

A - B + B - C = 75

A - C = 75

$\therefore$ A + B + C = 180^0

75 + C + 15 + C = 180^0

3C + 90 = 180^0

C = 30^0

$\Rightarrow$ A - C = 75^0

$\Rightarrow$ A = 75 + 30

$\Rightarrow$ A = 105^0

25.

Sol. (c)

$= \frac{4\left[17^3 - 7^3\right]}{\left(17^2 + 7^2 + P\right)} = 40$

$= \frac{4(17-7)\left(17^2 + 7^2 + 17\times 7\right)}{\left(17^2 + 7^2 + P\right)} = 40$

$17^2+7^2+P = 17^2+7^2+17\times 7$

$P = 17\times 7 = 119$

26.

Sol. (c)

$\frac{\sqrt{5}-1}{\sqrt{5}+1} = \frac{\sqrt{5}-1}{\sqrt{5}+1}\times\frac{\sqrt{5}-1}{\sqrt{5}-1} = \frac{\left(\sqrt{5}-1\right)^2}{4}$

$\sqrt{\frac{\sqrt{5}-1}{4}} = \frac{\sqrt{5}-1}{2} = \frac{2.24-1}{2} = \frac{1.24}{2} = 0.62$

27.

Sol. (b)

$x^2 - 4x + 1 = 0$

$x^2 + 1 = 4x$

$x + \frac{1}{x} = 4$ $\Rightarrow x^2 + \frac{1}{x^2} = 4^2 - 2 = 14$

$\left(x^2 + \frac{1}{x^2}\right)^3 = 14^3$

$x^6 + \frac{1}{x^6} + 3\left(x^2 + \frac{1}{x^2}\right) = 2744$

$x^6 + \frac{1}{x^6} + 3\times 14 = 2744$

$x^6 + \frac{1}{x^6} = 2744 - 42 = 2702$

28.

Sol. (b) As we know

$(x + y + z)^2 = x^2 + y^2 + z^2 + 2(xy + yz + zx)$

$\Rightarrow 3^2 = 101 + 2(xy + yz + zx)$

$\Rightarrow 2(xy + yz + zx) = 9 - 101$

$\Rightarrow 2(xy + yz + zx) = -92$

$\Rightarrow -(xy + yz + zx) = -92/2$

$\Rightarrow (xy + yz + zx) = -46$

Again, As we know,

$x^3 + y + z^3 - 3xyz = (x+y+z)\,[(x + y + z)^2 - 3(xy + yz + zx)]$

$x^3 + y^3 + z^3 - 3xyz = 3[3^2 - 3\times(-46)]$

$= 3\,[9+138] = 3\times 147 = 441$

$\sqrt{[x^3 + y^3 + z^3 - 3xyz]} = \sqrt{441} = 21$

29.

Sol. (d) $\angle BOC = 90^0 + \frac{\angle A}{2} = 90^0 + \frac{40^0}{2}$

$= 90^0 + 20^0 = 110^0$

30.

Sol. (c) $1 + x = 1 + \frac{a-b}{a+b} = \frac{2a}{a+b}$

$1 + y = 1 + \frac{b-c}{b+c} = \frac{2b}{b+c}$

$1 + z = 1 + \frac{c-a}{c+a} = \frac{2c}{c+a}$

$1 - x = \frac{2b}{a+b}$

$1 - y = 1 - \frac{b-c}{b+c} = \frac{b+c-b+c}{b+c} = \frac{2c}{b+c}$

$1 - z = \frac{2a}{c+a}$

$\therefore \quad \frac{(1+x)(1+y)(1+z)}{(1-x)(1-y)(1-z)} = 1$

PART - III : PHYSICS & CHEMISTRY

1.

Sol. (b) 20 Hz to 20,000 Hz - the audible range of frequency for a healthy human .

2.

Sol. (c) **Momentum**

A rocket expels gas at high velocity. By conservation of momentum, the rocket gains an equal and opposite momentum, causing it to accelerate.

3.

Sol. (c) Frequency - Pitch is the perceptual property of sounds that allows their ordering on a frequency-related scale.

4.

Sol. (c) Dispersion

Splitting of white light into its constituent colors on passing through a prism is called dispersion

5.

Sol. (c) **Uniform**

This is an example of inertia. The coin retains the uniform horizontal velocity of the train, so it lands back in the hand. If the train accelerated or retarded, it would land behind or in front.

6.

Sol. (a) The particle is at rest between 2s and 4s. The slope of a position-time graph represents velocity. From 2s to 4s, the graph is a horizontal line (slope = 0), indicating the position is not changing, so the velocity is zero.

7.

Sol. (a) 24 km/h

Average speed is Total Distance / Total Time.

Time to go: $t_1 = 60/30 = 2$ hr.

Time to return: $t_2 = 60/20 = 3$ hr.

Average Speed = $\frac{60+60}{2+3} = \frac{120}{5} = 24 km/h$

8.

Sol. (d) **60 W**

To lift at constant velocity, the upward force must equal the weight: F = mg = 2 kg × 10 m/s^2 = 20 N. Power = Force × Velocity = 20 N × 3 m/s = 60 W

9.

Sol. (c) **12.5 kW**

Output Work = mgh = 500 × 10 × 20 = 100, 000 J.

Output Power = Work/Time = 100, 000/10 = 10, 000 W = 10 kW.

Efficiency = Output Power / Input Power

$$\Rightarrow 0.80 = \frac{10\ \text{kW}}{\text{Input Power}}.$$

Input Power = 10/0.80 = 12.5 kW.

10.

Sol. (c) **1:4**

By conservation of energy, the kinetic energy just before impact is equal to the initial potential energy (mgh).

KE_1 = mgh. KE_2 = (4m)gh.

The ratio of their kinetic energies is $KE_1 : KE_2$ = mgh : 4mgh, which simplifies to 1:4.

11.

Sol. (d) At boiling temperature, temperature becomes constant but heat is absorbed for the change of state from liquid to gas.

12.

Sol. (c) Iodine is solute and Alcohol is solvent

13.

Sol. (d) Milk is not a homogeneous solution. It is a heterogeneous mixture of fat and water.

14.

Sol. (b) Solubility is the maximum amount of solute that can be dissolved in 100 g of solvent at a given temperature to form a saturated solution. Here, 20 g of NaOH is dissolved in 80 g of water.So, the amount of NaOH that can be dissolved in 100 g of water will be 25 g.

15.

Sol. (c) $\text{w/w \%} = \frac{20}{125} \times 100 = 4 \times 4 = 16\%$

16.

Sol. (b) $\text{Average atomic mass} = \frac{M_1x_1 \times M_2x_2}{x_1 + x_2}$

$$35.5 = \frac{35 \times x + 37(100 - x)}{x + 100 + x}$$

3550 = 35x + 3700 – 37x

3550 – 3700 = –2X

–150 = –2x

x = 75%

x_2 = 25%

17.

Sol. (d) Hydrogen gas has maximum calorific value i.e. 150,000 kJ/kg

18.

Sol. (c) Aluminium is the most abundant metal in the earth's crust.

19.

Sol. (d) Pb (Lead) is the poorest conductor of heat.

20.

Sol. (c) CNG is a natural gas, which is not obtained from petroleum.

PART - IV : BIOLOGY

1.

Sol. (d) Epidermis

Epidermis is an epithelial tissue, not connective. Connective tissues include blood, bone, cartilage, and are responsible for binding and supporting body parts.

2.

Sol. (b) Leucoplast

Leucoplast is specialized in storing starch granules. Chromoplasts store pigments, while chloroplasts help in photosynthesis, Lysosome is considered as suicidal bag contains hydrolytic enzymes.

3.

Sol. (b) Bacteria

Typhoid is mainly caused by the bacterium S*almonella*, not by viruses, fungi or protozon.

4.

Sol. (c) Diabetes

Diabetes is a non-communicable (lifestyle/metabolic) disease, while cholera, typhoid, and influenza are infectious and communicable.

5.

Sol. (a) Both A and R are true, and R is the correct explanation of A.

In mitosis, the chromosome number remains constant in daughter cells, equal to the parent cell ($2n \rightarrow 2n$), hence it is called equational division.

6.

Sol. (b) Water is supplied drop by drop at the root zone

Drip irrigation conserves water, reduces weed growth, and ensures that only the root zone gets sufficient water, preventing wastage.

7.

Sol. (a) 1-d, 2-a, 3-c, 4-b

Pituitary gland $\rightarrow$ Growth hormone (d)

Thyroid gland $\rightarrow$ Thyroxine, controls metabolism (a)

Pancreas $\rightarrow$ Insulin, regulates blood sugar (c)

Adrenal gland $\rightarrow$ Adrenaline, helps in emergency (b)

8.

Sol. (b) 1, 3 and 4 only

Statement 2 is wrong, because the common Indian honeybee is Apis indica, not Apis mellifera (which is a European Italian bee introduced in India for higher yield).

9.

Sol. (b) Bacterium

Bacteria are the smallest living cells. Viruses are smaller than bacteria but are not considered living unless inside a host.

10.

Sol. (b) Vas deferens

Vas deferens is a muscular tube that transports sperm from testes to urethra. Ureter carries urine, fallopian tube is present in females, and seminal vesicle adds fluid to semen.