UDAAN

A QUEST FOR SCIENCE ASPIRANTS

SCIENCE APTITUDE TEST

CLASS - 7

SOLUTIONS

TEST CODE - 28

IIT Ashram
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PART - I : MENTAL ABILITY

1.

Sol. (b) Judgement

Physician : Treatment :: Judge : ?

Physician gives Treatment

Similarly, Judge gives Judgement

2.

Sol. (d) Restaurant

Exercise is done in a gym

Eating is done in a restaurant

3.

Sol. (a) 101

Check the pattern:

$53 \rightarrow 65$ (+12)

$65 \rightarrow 77$ (+12)

$77 \rightarrow 89$ (+12)

Next number = 89 + 12 = 101

4.

Sol. (a) Mercury

Acetone, Petrol, Kerosene are liquids that burn (flammable)

Mercury $\rightarrow$ liquid metal, non-flammable

5.

Sol. (b) 9

What is the code for GOVERN-MENT?

Logic: Number of letters

REASON $\rightarrow$ 6 letters $\rightarrow$ code 5 (-1)

BELIEVED $\rightarrow$ 8 letters $\rightarrow$ code 7 (-1)

GOVERNMENT $\rightarrow$ 10 letters

10 - 1 = 9

6.

Sol. (b) Horse

Tiger, Horse, Lion, Giraffe**

= Tiger, Lion, Giraffe $\rightarrow$ wild animals

= Horse $\rightarrow$ domestic animal

7.

Sol. (b) 20

P = ×, Y = -

10 × 2 + 5 - 5 = 20 + 5 - 5 = 20

8.

Sol. (b) West

Facing North-West

90° clockwise $\rightarrow$ North-East

135° anti-clockwise $\rightarrow$ West

9.

Sol. (d) None of these

Every number divisible by 15 is also divisible by 5

So no such number

10.

Sol. (d) Damage

Damage, Demand, Destroy, Diamond

Alphabetically first = Damage

11.

Sol. (c) Green

Brinjal is violet $\rightarrow$ violet is coded as green

12.

Sol. (b) O M U E S

L A P T O P

A L P T P O

M O U S E

O M U E S

13.

Sol. (c) 3

The pattern 3 7 8 appears 3 times

14.

Sol. (b) Daughter in Law

Brother's son $\rightarrow$ nephew

Nephew's wife $\rightarrow$ nephew's wife

Mother of Nephew's wife $\rightarrow$ daughter-in-law

15.

Sol. (c) Oasis

Oasis is found in desert, others near water

PART - II : MATHEMATICS

1.

Sol. (a) 2

$$\frac{1+1+1-1}{1\times1\times1}=2$$

2.

Sol. (b) 9

$6^x = 6^3$

$x = 3$

$x^2 = 3^2 = 9$

3.

Sol. (d) 4

$4x^2y^2 \Rightarrow$ degree of $4x^2y^2$

$= 4$

degree 4

4.

Sol. (b) 70^0

$110^0 + x = 180$

$x = 70^0$

5.

Sol. (a) 47^0

$\angle BOQ = 47^0$

Vertically opposite angles.

6.

Sol. (b) 5

AB = AC

$5x + 1 = 2x + 13$

$3x = 12$

$x = 4$

BC = 2x - 3

$= 2 \times 4 - 3 = 5$

$= 8 - 3 = 5$

7.

Sol. (a)

Original price = 3,50,000

Change in price = 3,70,000 – 3,50,000
 = 20,000.

Percentage increase

$= \dfrac{\text{Amount of change in price}}{\text{Original price}} \times 100$

$= \dfrac{20,000}{3,50,000} \times 100 \quad = \dfrac{2}{35} \times 100 = \dfrac{2}{7} \times 20$

$= \dfrac{40}{7} = 5\dfrac{5}{7}$

Percentage increase = $5\dfrac{5}{7}\%$

Hence, percentage increase in price of car $= 5\dfrac{5}{7}\%$

8.

Sol. (b) 30%

Percentage of females = 30%

Percentage of males = 40%

Percentage of children = (100 – 30 – 40)%
= 30%

9.

Sol. (a) 54.33

$$\frac{45+48+62+76+57+38}{6}=54.33$$

10.

Sol. (a) 7.5 cm

Area of parallelogram = base x height

$360 = 48 \times h =$

so, $h = \dfrac{360}{48} = \dfrac{30}{4} = 7.5 cm$

11.

Sol. (d) 24

$\dfrac{1}{2}x + 7 = 19 \Rightarrow \dfrac{1}{2}x = 12 \Rightarrow x = 24$

12.

Sol. (c) 5:8

Bus speed = 225/3 = 75

Train speed = 600/5 = 120

Ratio = 75:120 = 5:8

13.

Sol. (a) One

14.

Sol. (b) Cuboid

Brick has length, breadth, height $\rightarrow$ Cuboid

15.

Sol. (d) 60°

Sum = 18 parts = 360°

1 part = 20°

Largest = 120°, smallest = 60°

Difference = 60°

16.

Sol. (c) 70 m

Width = 42

Length = (5/3)×42 = 70 m

17.

Sol. (b)

$$1 - \frac{10}{7} = \frac{-3}{7}$$

18.

Sol. (b) -6x

Coefficient of a²bc in -6xa²bc = -6x

19.

Sol. (b) 2.67

2.007, 2.067, 2.607, 2.67

20.

Sol. (a) 988001

Largest 3-digit number = 999

Smallest 3-digit number = 100

Sum = 1099

Difference = 899

Product = 1099 × 899 = 988001

21.

Sol. (a) $\frac{1}{5}$

1 hour = 60 minutes

Given minutes = 12

12 minutes $= \frac{12}{60} = \frac{1}{5}$

22.

Sol. (c) 70°

Sum of angles of a triangle = 180°

Third angle = 180° -(67°+43°)

Third angle=180°-(67°+43°)

= 180° - 110° = 70 °

=180°-110°=70°

23.

Sol. (b) 750

Diameter = 70 cm

Circumference $= \pi \times d$

$= \frac{22}{7} \times 70 = 220 cm$

Distance = 1.65 km = 1650 m = 165000 cm

No. of revolutions $= \frac{165000}{220} = 750$

24.

Sol. (a) 7

Let the number be x

3x - 5 = 16

3x=21

x=7

25.

Sol. (b) 100

Multiply numerator and denominator by 1000:

$$\frac{0.213}{0.00213} = \frac{213}{2.13}$$

Now divide: 213 ÷ 2.13 = 100

26.

Sol. (a) Rs. 4000

Income = 7 parts

Total income = Rs14000

1 part = 14000 ÷ 7 = Rs 2000

Expenditure = 5 parts = 5 × 2000 = Rs 10000

Saving = Income - Expenditure

= 14000 - 10000 = Rs 4000

27.

Sol. (c) 180°

1 right angle = 90°

2 right angles = 180°

1 straight angle = 180°

2 straight angles = 360°

Difference = 360° - 180° = 180°

28.

Sol. (b) $2\dfrac{47}{60}$

$\Rightarrow 5\dfrac{1}{2} = \dfrac{11}{2}$ $\qquad \Rightarrow 3\dfrac{2}{3} = \dfrac{11}{3}$

$\Rightarrow 7\dfrac{1}{5} = \dfrac{36}{5}$ $\qquad \Rightarrow 6\dfrac{1}{4} = \dfrac{25}{4}$

LCM of (2, 3, 5, 4) = 60

$\dfrac{330\text{-}220\text{+}432\text{-}375}{60} = \dfrac{167}{60} = 2\dfrac{47}{60}$

29.

Sol. (a) 144^0

Let smaller angle = x Larger angle = 4x

x + 4x = 180

5x = 180 $\Rightarrow$ x = 36

Larger angle:

$4 \times 36 = 144^0$

30.
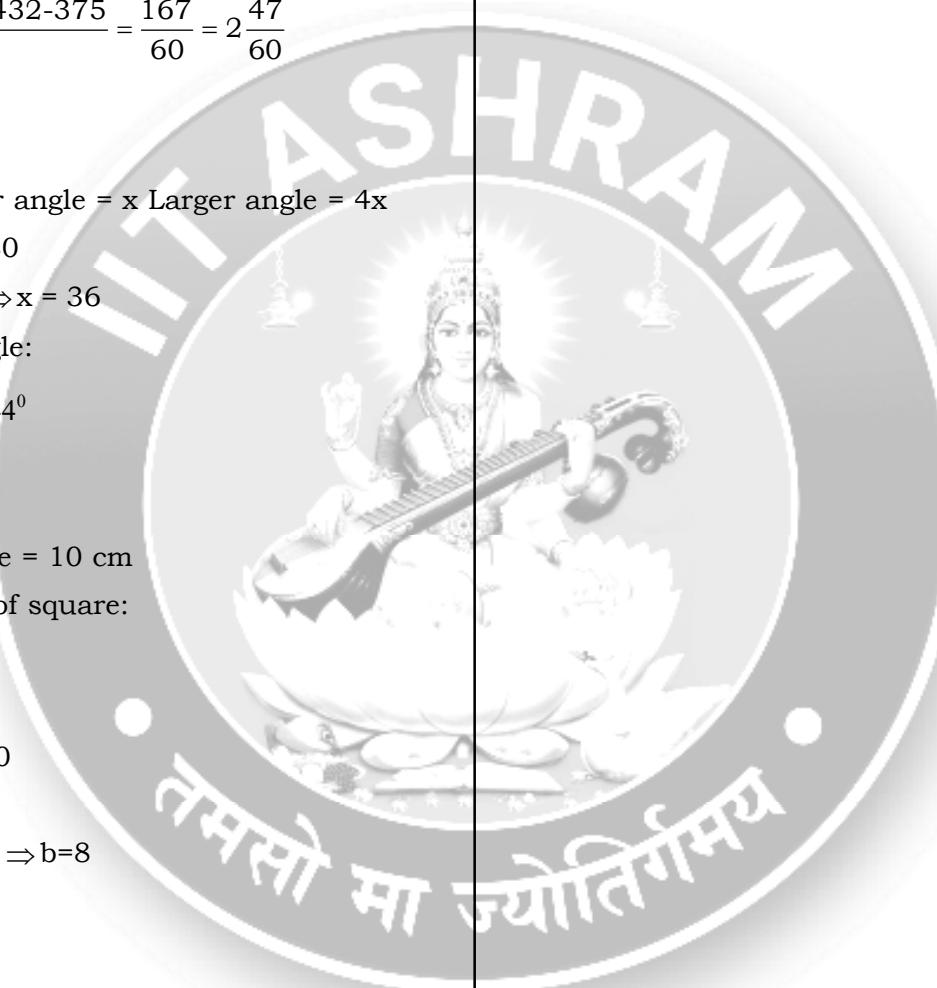
Sol. (a) 8 cm

Square side = 10 cm

Perimeter of square:

$4 \times 10 = 40$

Rectangle:

2(l + b) = 40

l + b = 20

12 + b = 20 $\Rightarrow$ b=8

PART - III : PHYSICS & CHEMISTRY

1.
Sol. (b)

Expansion joints are designed to accommodate the expansion and contraction of bridge materials caused by temperature variations due to weather. These joints help prevent the bridge from buckling or cracking, ensuring its structural integrity and safety.

2.
Sol. (d) Moon

A non-luminous object does not produce its own light. The Moon only reflects light from the Sun, so it is non-luminous.

Sun, candle flame and electric bulb all produce their own light.

3.
Sol. (c)

Time taken = 15 min

Speed = 2 m/min

Distance = speed x time = 2 x 15 = 30 m

Distance between Salma's school and her house is 30 m.

4.
Sol. (c) It is formed on the opposite side of the light source

A shadow is formed when light falls on an opaque object and is blocked.

The shadow always appears on the opposite side from where the light is coming.

5.
Sol. (c) Gravitational force

The gravitational force of Earth pulls everything downward toward the ground.

That is why objects fall when we drop them.

6.
Sol. (d) All of the above

A force can:

• Move an object

• Change the shape of an object (e.g., pressing a sponge)

• Change the direction of motion (e.g., hitting a football)

So the correct answer is all of the above.

7.
Sol. (c) Solid

Particles in solids are tightly packed, so sound travels fastest in solids.

It is slower in liquids, slower in gases, and cannot travel in vacuum because no particles are present.

8.
Sol. (b) Opposite to the direction of motion

When an object moves, friction tries to slow it down by acting in the opposite direction of motion.

Example: rubbing hands or brakes of a bicycle.

9.
Sol. (b) Hot object to cold object

Heat energy always moves from a hotter object to a colder object until both become equal in temperature.

It never flows from cold to hot.

10.
Sol; (c) Kelvin

The standard international (SI) unit of temperature is Kelvin (K).

Celsius and Fahrenheit are commonly used units but not SI units.

11.
Sol. (b) Gas has no definite volume and no definite shape.

Gases have neither a fixed shape nor a fixed volume.

12.
Sol. (b) Ammonia

Ammonia (NH_3) is formed by nitrogen + hydrogen $\rightarrow$ compound.

13.
Sol. (c) Neutron

Hydrogen is the only element whose most common isotope has no neutron.

14.

Sol. (c) O_2

Oxygen supports combustion.

15.

Sol; (b)   Separating funnel

Immiscible liquids - separating funnel.

16.

Sol. (c)   Slightly acidic

CO_2 in air makes rain slightly "acidic.

17.

Sol. (b) $NaHCO_3$

Formula of baking soda = $NaHCO_3$.

18.

Sol. (b)   Chlorination

Chlorine is a powerful disinfectant that kills harmful microorganisms.

19.

Sol. (c)   Carbon dioxide

Acid (lemon juice) + Baking soda $\rightarrow$ CO_2 gas $\Rightarrow$ Bubbles = CO_2 production.

20.

Sol. (a)   Soap water

Turmeric $\rightarrow$ Red-brown only with bases. Soap water = basic

PART - IV : BIOLOGY

1.

Sol: (c)   Euglena

Euglena shows both autotrophic (photosynthesis) and heterotrophic nutrition.

2.

Sol: (c)   Transport oxygen

Haemoglobin carries oxygen from the lungs to all parts of the body.

3.

Sol: (b)   Transpiration

Transpiration is the process of loss of water in the form of vapour from plant leaves.

4.

Sol: (c)   Stamen

Stamen is the male reproductive part of a flower.

5.

Sol: (b)   Anaerobic respiration

Anaerobic respiration releases energy without the use of oxygen.

6.

Sol: (c)   Amylase

Amylase in saliva digests starch into simple sugars.

7.

Sol: (c)   Alveoli

Alveoli have thin walls and rich blood supply for gaseous exchange.

8.

Sol: (b)   White blood cells

WBCs protect the body by fighting disease-causing organisms.

9.

Sol: (d)   Vitamin D

Vitamin D is synthesized in the skin in the presence of sunlight.

10.

Sol: (b)   Urea

Kidneys filter urea from the blood and excrete it in the form of urine.