UDAAN

A QUEST FOR SCIENCE ASPIRANTS

SCIENCE APTITUDE TEST

CLASS 7

ANSWER KEY WITH SOLUTIONS

DATE : 19.01.25

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PART - I : MENTAL ABILITY

1.

Sol: (c)

8, 24, 16/7, 7, 14/. 6, 18, 12/5, 5, 10 Hence he answer is 7

2.

Sol: (c)

Sequence: 0, 2, 3, 6, 6, 20, 9, 54, 12

Check if there's a pattern:

0 → 2 (multiply by 2)

2 → 3 (add 1)

3 → 6 (multiply by 2)

6 → 6 (no change)

6 → 20 (no clear pattern)

20 → 9 (subtract)

9 → 54 (multiply by 6)

54 → 12 (divide by 4)

The number 20 doesn't fit the pattern. It should be something like 12 or another number that fits better in the alternating sequence.

3.

Sol: (d)

Sequence: ABCA, BCDB, CDEC, DEFD, ?

This pattern involves shifting the letters. The next term after DEFD will follow the pattern of the previous shifts:

First letters: A, B, C, D, E ? F

Second letters: B, C, D, E, F ? G

Third letters: C, D, E, F, G ? H

Fourth letters: A, B, C, D, E ? F

So, the next term is EFGF

4.

Sol: (d)

Sequence: Q, N, K, H, ?

The letters decrease by 3 places each time:

Q → N → K → H → E (Q → N → K → H → E is a sequence of 3 steps backward)

5.

Sol: (d)

Series: ab_aabb_ _ bb_

Let's break it down:

The pattern repeats in cycles. After "ab," the sequence repeats "aabb".

The correct continuation is abab, completing the sequence with alternating "a" and "b".

6.

Sol: (b)

7.

Sol: (c)

To determine the code:

BOOK = B (2) + O (15) + O (15) + K (11) = 2 + 15 + 15 + 11 = 43.

PEN = P (16) + E (5) + N (14) = 16 + 5 + 14 = 35.

8.

Sol: (c)

Total students = 23, so their ranks from the last are:

13th from the top ? 23 - 13 + 1 = 11th from the last

14th from the top ? 23 - 14 + 1 = 10th from the last

9.

Sol: (c)

First, do the multiplication and division:"

$100 \times 10 = 1000$

$\frac{2000}{100} = 20$

Now, the expression becomes:

Next, perform the addition and subtraction:

1000-100=900

900 + 20 = 920

10.

Sol: (b)

11.

Sol: (b)

12.

Sol: (d)

$\Rightarrow$ MATCH $\rightarrow$ OCVEJ:

M $\rightarrow$ O (+2), A $\rightarrow$ C (+2), T $\rightarrow$ V (+2), C $\rightarrow$ E (+2), H $\rightarrow$ J (+2).

$\Rightarrow$ Applying the same code shift for OVER:

O $\rightarrow$ Q (+2), V $\rightarrow$ X (+2), E $\rightarrow$ G (+2), R $\rightarrow$ T (+2). So, OVER becomes QXGT.

13.

Sol: (a)

D is the father of C, and C is the mother of A.

D is the grandfather of B.

14.

Sol: (c)

Starts at A, walks east (towards the right), then turns left (north), and turns right (east again). She ends up east.

15.

Sol: (a)

Total students = 16 + 49 - 1 = 64.

PART - II : MATHEMATICS

1.

Sol: (a)

(a) All natural numbers are whole numbers: True (natural numbers start from 1, and whole numbers include 0 along with natural numbers).

(b) All whole numbers are natural numbers: False (whole numbers include 0, which is not a natural number).

(c) The number 1 is the first and the smallest whole number: False (The smallest whole number is 0).

(d) There is a greatest whole number: False (Whole numbers go on infinitely)

Answer: (a) All natural numbers are whole numbers

2.

Sol: (b)

(a) 0: Predecessor of 0 is not a natural number.

(b) 1: Correct (1 is the smallest natural number, so it has no predecessor).

(c) 10: Has a predecessor.

(d) 100: Has a predecessor.

3.

Sol: (c)

Factors of 12: 1, 2, 3, 4, 6, 12

Factors of 18: 1, 2, 3, 6, 9, 18

Common factors: 1, 2, 3, 6

Answer: (c) 1, 2, 3, and 6

4.

Sol: (c)

(a) Sector: A part of the circle.

(b) Quadrant: A quarter of a circle.

(c) Circumference: Correct (the total distance around a circle).

(d) Segment: A part of the circle enclosed by a chord.

5.

Sol: (c)

(a) –500: It's a negative integer, but not the greatest.

(b) –100: It's greater than –500 but not the greatest.

(c) –1: Correct (–1 is the greatest negative integer).

(d) Does not exist: False, as the greatest negative integer is –1.

6.

Sol: (b)

Fractions with the same denominator are called like fractions. The numerators of like fractions may or may not be the same.

Here are some examples of like fractions:

$\Rightarrow$ 1/4, 2/4, 3/4, 7/4, and 4/4

$\Rightarrow$ 2/10, 3/10, 8/10, 5/10, and 15/10

$\Rightarrow$ 2/5, 1/5, 7/5, 8/5, and 5/5

$\Rightarrow$ 9/27, 1/27, 4/27, 3/27, and 17/27

$\Rightarrow$ 1/7, 2/7, 5/7, 6/7

$\Rightarrow$ 1/2, 3/2, 5/2, 7/2

7.

Sol: (a)

8.

Sol: (d)

9.

Sol: (b)

10.

Sol: (b)

11.

Sol: (b)

0.5 + 0.005 + 0.05 = 0.555

12.

Sol: (d)

(a) 0.354: Less than 0.71.

(b) 0.672: Less than 0.71.

(c) 0.1254: Less than 0.71.

(d) 0.8: **Greater than** 0.71

13.

Sol: (c)

2 km 5 m = 2 + 5/1000 = 2.005 km

14.

Sol: (c)

2 L = 2000 ml

Ratio of 250 ml to 2000 ml = 250:2000 = 1:8

15.

Sol: (b)

The mean proportion in a proportion

a : b = c : d a:b=c:d is the square root of the product of the extremes (ad):

Mean proportion

$= \sqrt{25 \times 4} = \sqrt{100} = 10$

16.

Sol: (b)

Using the rule of proportion:

$$\Rightarrow \frac{6}{x} = \frac{12}{36}$$

$$\Rightarrow x = \frac{6 \times 36}{12} = 18$$

17.

Sol: (a)

$\Rightarrow$ Perimeter of square = 4 × 300 = 1200 meters

$\Rightarrow$ Cost of fencing = 1200 × 20 = Rs 24000

18.

Sol: (b)

Perimeter = 5 + 2 + 3 = 10 cm

19.

Sol: (c)

Side of square $=\sqrt{100} = 10$

Perimeter = 4 × 10 = 40 cm

20.

Sol: (b)

a) 1.541 < 1.590: True.

(b) 4.5 > 4.500: True (they are equal).

(c) 0.8 < 0.81: True.

(d) 8 > 0.8: True.

Answer: (b) 4.5 > 4.500

21.

Sol: (c)

The additive identity is 0, as adding 0 to any integer does not change the integer.

22.

Sol: (c)

Convert each fraction to decimal form:

$\frac{5}{10} = 0.5$

$\frac{3}{100} = 0.03$

$\frac{1}{1000} = 0.004$

Add them together:

0.5 + 0.03 + 0.004 = 0.534

So, the value in decimal form is 0.534.

23.

Sol: (d)

$\Rightarrow$ The digit 2 is in the thousandths place.

$\Rightarrow$ The digit 6 is in the ten-thousandths place.

$\Rightarrow$ The digit 5 is in the hundred-thousandths place.

$\Rightarrow$ The digit 7 is in the millionths place.

$\therefore$ Thus, the place value of the encircled digit 6 is in the ten-thousandths place.

24.

Sol: (d)

The opposite side of a rectangle are equal and parallel.

25.

Sol: (b)

If the angle is, then x + (90 - x) = 90 and x - (90 - x) = 20

$\Rightarrow$ 2x = 110 so $x = 55^0$

26.

Sol: (b)

A gas pipe is an example of a cylinder.

27.

Sol: (d)

A cuboid has 12 edges.

28.

Sol: (d)

Line segment: A line segment has a measurable length.

29.

Sol: (a)

co-primes: 12 and 23 have no common factors other than 1.

30.

Sol: (b)

LCM of 9, 14, and 21 is 126.

PART - III : PHYSICS & CHEMISTRY

1.

Sol: (a)

In thunderstorm it is not safe to lie on the ground. Low pressure prevailing at the centre of the cyclone is called the eye.

2.

Sol: (b)

An electric bell works with the principle of working of electromagnetism. When the switch is pushed on, the circuit gets completed and the current starts flowing through the U-shaped electromagnet which creates a magnetic field in the core. This attracts the iron armature. When the armature moves towards the electromagnet, the hammer strikes the gong and the bell rings.

3.

Sol: (c)

A small bulb is placed near the converging lens, and the bulb is switched on, which produces the parallel beam of light.

4.

Sol: (d)

Factors like wind speed, wind direction, temperature and humidity contribute to the development of cyclones.

5

Sol: (c)

We use electrical devices in our homework on a specific range of current. But due to short circuits or overloading, it is seen that there is a sudden increase in the current. The increase in the current in some cases is so massive that it blows up the electrical devices and sometimes catches fire, thus damaging the property.To prevent such mishaps, a fuse is installed in the primary circuit of all the buildings so that if there is a sudden increase in the current, the fuse blows up and the circuit is broken. Only a certain amount of current is allowed to flow through the circuits, i.e., the maximum tolerance of the fuse up to which it can work smoothly.If the current overshoots the maximum limit mentioned on the fuse, the fuse wire will melt due to overheating and thus breaking the circuit.

6.

Sol: (d)

The letters that do not show lateral inversion when viewed in a plane mirror are I, O, A, V, W, M, H, T, U, X, and Y

7.

Sol: (b)

A rainbow can only be seen in the sky when the sun is behind you. Rainbow can be formed if there is moisture in the air.

8

Sol: (b)

Speed = displacement/time

9.

Sol: (c)

Absolute zero is -273.15°C on the Celsius scale

10

Sol: (d)

In a closed circuit, electric current moves from terminal

11.

Sol: (a)

Baking soda produce CO_2 on heating, so it is used to make bread to make is spongy.

12.

Sol: (d)

An aqueous so turns red litmus so blue, means it is a base. Adding HCl would reverse this change.

13.

Sol: (b)

The natural indicator litmus is extracted from lichens.

14.

Sol: (b)

Calamine $ZnCO_3$ is used to neutralize ant sting.

15.

Sol: (a)

When sodium chloride is added to water, there is no change in molecular composition. So, it is a physical change.

16.

Sol: (b)

The candle melted on heating but no new substance is formed. So, it is a physical change.

17.

Sol: (b)

During a physical change, the following changes occur: (i) Change in state and colour. (ii) Change is temporary. (iii) Change is reversible. But there is no change in composition.

18.

Sol: (a)

Lime juice is acidic in nature.

19.

Sol: (c)

Biogas and sludge are products of wastewater treatment.

20.

Sol: (a)

Snow and ice - Solid form. Water vapor - Gaseous form.

PART - IV : BIOLOGY

1.

Sol: (c) Auxin

Auxin is a plant hormone that promotes stem elongation and regulates growth.

2.

Sol: (c) Carbon dioxide

In photosynthesis, plants absorb carbon dioxide and use it, along with sunlight, to make food.

3.

Sol: (b) Transport of water

Xylem transports water and minerals from the roots to the leaves in plants.

4.

Sol: (b) Lungs

The human respiratory system includes the lungs, which are responsible for gas exchange.

5.

Sol: (c) Snake

Snakes are oviparous, meaning they lay eggs, unlike mammals that give birth to live young.

6.

Sol: (a) Stamen

The stamen is the male part of a flower that produces pollen.

7.

Sol: (b) Cuscuta

Cuscuta is a parasitic plant that attaches to host plants to absorb nutrients.

8.

Sol: (b) Osmosis

Osmosis allows water to enter the roots of plants from the soil by moving through a semi-permeable membrane.

9.

Sol: (b) Circulatory system

The circulatory system transports blood, oxygen, and nutrients to all parts of the body.

10.

Sol: (d) Heart

The heart is part of the circulatory system, not the excretory system. The lungs, kidneys, and liver play roles in excretion.