

IIT ASHRAM BRINGS...

IIT ASHRAM

JEE MAINS || JEE ADVANCED || MEDICAL || FOUNDATION

SCIENCE APTITUDE
TEST (2016-17)

CLASS **6th**



SAMPLE PAPER

SOLUTIONS & ANSWER KEY

for

Part - I : Mental Ability

Part - II : Mathematics

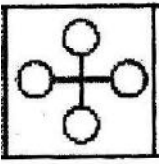
Part - III : Physics/ Chemistry

Part - IV : Biology

MENTAL ABILITY

1.

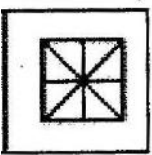
Sol. (c) (Explanation: had the embedded figure – others don't)



(C)

2.

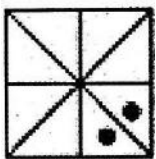
Sol. (d) (Triangle on the top right quadrant and the one opposite it)



(D)

3.

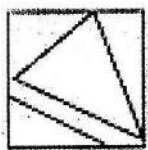
Sol. (b) (Dots are in the corners)



(B)

4.

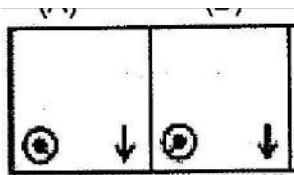
Sol. (a) (Completes the star with a line parallel to one side)



(A)

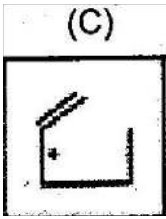
5.

Sol. (b) (The minor error is that the arrow should be position top-center. The dial within the circle is rotating anti-clockwise and hence this is the correct position)



6.

Sol. (c) (completes the circulatory pattern of the parallel line and the dot)



7.

Sol. (d) (Since the first figure rotates anti-clockwise, the other structure will rotate likewise.)

8.

Sol. (a) (The information given in the question clearly describes the population as 50% working in the field and the remaining 50% working in the factories.)

9.

Sol. (c) (in all other diagrams, only one sign is pointing in the other direction)

10.

Sol. (a) (All the other figures have sides/ edges)

11.

Sol. (b) (To calculate number of Odd Days, divide 352 by 7. The remainder = the number of Odd days
 $\Rightarrow 352 / 7 = 50$ weeks and 2 odd days)

12.

(c) (Calculate odd days for each month: $6+0+3+2+3+2+3+3+2+3+2+25 = 54 / 7 = 5$ (remainder)
 \Rightarrow Friday + 5 = Wed)

13.

Sol. (c) (Calculate the number of odd days per year from 2001. The moment we reach 7, the year after that will have the same calendar year, as the total number of odd days becomes 0: (2001) 1 odd day + (2002) 1 odd day + (2003) 1 odd day + (2004) 2 odd days + (2005) 1 odd day + (2006) 1 odd day = 7 odd days. Therefore, 2007 will have the same calendar)

14.

Sol. (c) (The code is directly related to the alphabets. R becomes T – meaning the alphabet S in the middle is skipped. Similarly, E becomes G, C becomes E and so on. Following the same method, we obtain the answer as option C)

15.

Sol. (d) (Odd alphabets include: A,C,E,G,I,K,M etc. The other alphabets (even) are thus: B,D,F,H,J,L,N, etc. Putting the word together following this instruction provides us the answer option)

16.

Sol. (c) (False is the opposite of True, like Sink is the opposite of Float.)

17.

Sol. (d) (Similar to the above question, each alphabet in the series is obtained by skipping the immediately next alphabet. However, the difference between each pair is as follows: S to L is +18, U to P is +20, W to T is +22 and Y to X is +24. Following the same pattern, we get: $P + 18 = I$, $R + 20 = M$, $T + 22 = Q$ and $V + 24 = U$

18.

Sol. (D) (5 men working for 12 days = $5 \times 12 = 60$ days of work. Dividing 60 days of work by 10 days = 6 people.)

19.

Sol. (d) (Bowl – like basket, pail and pan, has space to keep food/ other things in it. Spoon is too small.)

20.

Sol. (C) (You wear socks on your feet, like you wear Gloves on your hands.)

MATHEMATICS

1.
Sol. Integers are not closed over division.

2.
Sol. $\frac{5}{7} = 0.71$ approx.

so, $\frac{5}{7}$ lies between 0 and 1.

3.
Sol. $\frac{1}{3} \div 6 = \frac{1}{3} \times \frac{1}{6} = \frac{1}{18}$

4.
Sol. $88.888 = \frac{88888}{1000}$

Now, $\frac{88888}{1000} \times 1000 = 88888$

\therefore 88.888 should be multiplied by 1000.

5.
Sol. $60 \div 50 = \frac{60}{50} = \frac{6}{5} = 1.2$

6.
Sol. cost of 10 erasers = Rs. 100.50

\therefore cost of 1 eraser = Rs. $\frac{100.50}{10} =$ Rs. 10.05

7.
Sol. -1 is smallest

8.
Sol. $a^8 \div a^3 = \frac{a^8}{a^3} = a^{8-3} = a^5$

9.
Sol. $(-1)^{23} = (-1)^{\text{odd}} = -1$

10.
Sol. $45^0 + 19^0 = 1 + 1 = 2$

11.
Sol. $(-4)^3 = (-4) \times (-4) \times (-4) = -64$

12.
Sol. 9.9×10^4 is in scientific notation.

13.
Sol. $4ab^3 = 4 \times (1) \times (-3)^3$ when $a = 1, b = -3$
 $= 4 \times (-27) = -108$

14.

Sol. $4m^2n + (-3m^2n) = 4m^2n - 3m^2n = m^2n.$

15.

Sol. $2m - 6 = 14,$
then, $(2m - 6) + 4 = 14 + 4 = 18$

16.

Sol. when $m = 4$, $LHS = 3m = 3 \times 4 = 12$
 $LHS = 12$
 $RHS = 12$
So $LHS = RHS.$
Hence $m = 4$ is the root of $3m = 12.$

17.

Sol. $2y + 1 = 7 \Rightarrow 2y = 7 - 1 \Rightarrow 2y = 6 \Rightarrow y = \frac{6}{2} = 3.$

18.

Sol. Let the two consecutive numbers are x and $x + 1.$
then, $x + (x + 1) = 63$
 $\Rightarrow 2x + 1 = 63 \Rightarrow 2x = 62 \Rightarrow x = 31$
Hence, the 2 consecutive numbers are 31 and 32.

19.

Sol. 1 litre = 1000 ml
 $\therefore 1 \text{ litre} : 200 \text{ ml} = 1000 \text{ ml} : 200 \text{ ml}$
 $= 5 \times 200 \text{ ml} : 200 \text{ ml}$
 $= 5 : 1$

20.

Sol. Cost of 12 bananas = Rs. 20
cost of 1 banana = $\text{Rs. } \frac{20}{12} = \frac{4 \times 5}{4 \times 3} = \frac{5}{3}$
 \therefore cost of 18 bananas = $\text{Rs. } \frac{5}{3} \times 18$
 $= \text{Rs. } 5 \times 6$
 $= \text{Rs. } 30$

21.

Sol. 108 apples \longrightarrow 18 boxes
1 apple \longrightarrow $\frac{18}{108}$ boxes
 \therefore for 60 apples \longrightarrow $\frac{18}{108} \times 60 = \frac{1}{6} \times 60 = 10$ boxes
Hence for 60 apples we need 10 boxes.

22.

Sol. 25 % of $x = 200$

$$\Rightarrow 25 \times \frac{1}{100} \times x = 200$$

$$\Rightarrow \frac{1}{4} \times x = 200 \quad \Rightarrow x = 200 \times 4$$

$$\Rightarrow x = 800$$

23.

Sol. $5x - x = 4x$

$$\begin{aligned} \therefore \text{percentage increase} &= \frac{4x}{x} \times 100 \\ &= 4 \times 100 = 400\% \end{aligned}$$

24.

Sol. X % of 2 hours = 6 minutes.

$$\Rightarrow x \times \frac{6}{5} = 6$$

$$\therefore x = 6 \times \frac{5}{6} = 5\%$$

25.

Sol. $A = \text{Rs. } 120, P = \text{Rs. } 100, T = 2 \text{ years, } R = ?$

Now, $I = A - P = \text{Rs } (120 - 100) = \text{Rs. } 20$

$$\text{Also, } I = \frac{P \times T \times R}{100} \Rightarrow R = \frac{1 \times 100}{P \times T}$$

$$\therefore R = \frac{20 \times 100}{100 \times 2} = 10\%$$

26.

Sol. x % of one - third of z

$$= x \times \frac{1}{100} \times \frac{1}{3} \times z = \frac{xz}{300}$$

27.

Sol. The point of concurrence of medians of a triangle is called the centroid.

28.

Sol. Exterior angle = 75°

Now, $40^\circ + 35^\circ = 75^\circ$

Exterior angle = sum of two interior appt. angles

\therefore the required angles are 40° and 35° .

29.

Sol. In a triangle sum of any two sides is greater than third side. This possible sides of a triangle are

3 cm, 4cm, 5 cm.

30. The length of diagonal = $\sqrt{9^2 + 12^2} = \sqrt{81 + 144}$

$$= \sqrt{225} = 15\text{cm.}$$

PHYSICS & CHEMISTRY

1. The Earth's complete travel around the sun is called revolution.
2. The force with which earth attracts towards it is gravitational force.
3. Iron and steel both are magnetic materials.
4. Alluvial soil is the most fertile soil.
5. Earth's primary source of energy is sun.
6. 21 June, is the longest day of the year in India because of position of sun on this day is over the Tropic of Cancer.
7. The resistor in a light bulb is called a filament.
8. All fossil fuels, moving water, solar energy all can be used to make electricity.
9. Magnet has two poles North pole and South Pole.
10. Switches are the devices which are used to break the circuit.
11. Light travels in a straight path.
12. Coal, Diamond, Silver all are natural non-renewable resources.
13. A stethoscope device measures your heartbeat.
14. In summer we prefer light colour clothes to wear because they reflect maximum amount of light and heat energy.
15. The only natural satellite of the earth is moon.
16. Copper, Aluminium, gold all are metals and good conductor of electricity plastic is a bad conductor of electricity.
17. Oil has less density as compared to water thus oil floats on water.

BIOLOGY

1. Dietary fiber as non-soluble carbohydrate which is not present in milk.
2. Paneer has casein protein rest are plant protein.
3. Grass has parallel venations fibrous root.
4. The primary function of stem is conduction of water, formation of branches and bearing the flower and fruit but photosynthesis is the primary function of leaf.
5. Green plants are autotrophs and rest all organisms are heterotrophs. Heterotrophs include the (Herbivores and Carnivores).
6. Bacteria like Lactobacillus perform curdling of milk.
7. Snake does not have actual teeth by which it can chew the food. They have fangs.
8. Coriander, mint and Radish are herbs but only Bougainvillea are shrubs.
9. Maize is a monocot plant which has a fibrous root system.
10. During photosynthesis $6\text{CO}_2 + 12\text{H}_2\text{O} \rightarrow \text{C}_6\text{H}_{12}\text{O}_6 + 6\text{H}_2\text{O} + 6\text{O}_2$
 O_2 is released.
11. Earthworm has moist skin & it respire through skin.
12. Streamlined body helps organism to swim easily in water so the organism belongs to water.
13. Most colourful part of flower is petals.
14. Xerophytes belong to desert plant.
15. Camel doesn't perspire a lot because to prevent the loss of water.
16. The fertilized ovule converted in seed.