

IIT ASHRAM BRINGS...



CLASS

8

A QUEST FOR SCIENCE ASPIRANTS !

SCIENCE APTITUDE TEST (SAMPLE QUESTIONS PAPER)

Time : 1.30 : Hour.

Maximum Marks : 220

Please read the instructions carefully. You are allotted 15 minutes specifically for this purpose.

IMPORTANT INSTRUCTIONS

A. General:

1. This booklet consists of 55 questions.
2. Blank papers, clipboards, log tables, slide rules, calculators, cellular phones, pagers, and electronic gadgets in any form are not allowed to be carried inside the examination hall.
3. The answer sheet, a machine-readable Objective Response Sheet (OMR), is provided separately.
4. DO NOT TAMPER WITH / MUTILATE THE OMR OR THE BOOKLET.
5. Write Name and Address in capital letters of OMR sheet.
6. **Submit the OMR Sheet back to Invigilator after examination.**

B. Question paper format:

7. The question paper consists of 2 Sections.
SECTION - A : Mental Ability & Mathematics (25 Questions)
SECTION - B : Physics, Chemistry & Biology (30 Questions)

C. Marking Scheme :

8. For each question in Section A & B you will be awarded 4 marks if you have darkened only the bubble corresponding to the correct answer and zero mark if no bubble is darkened. In all other cases, minus one (-1) mark will be awarded.



SECTION A**(ON MENTAL ABILITY)**

- Find the missing term?
6, 11, 18, 27, 38, (.....), 66
(a) 58 (b) 54
(c) 51 (d) 59
- Choose the odd-one out:
(a) 212 (b) 343
(c) 757 (d) 511
- Find the missing term

$\begin{array}{c} \triangle \\ \text{5} \quad \text{3} \\ \text{19} \\ \text{4} \\ \text{A} \end{array}$	$\begin{array}{c} \triangle \\ \text{7} \quad \text{5} \\ \text{?} \\ \text{6} \\ \text{B} \end{array}$	$\begin{array}{c} \triangle \\ \text{6} \quad \text{4} \\ \text{29} \\ \text{5} \\ \text{C} \end{array}$
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 (a) 25 (b) 37
(c) 41 (d) 47
- D-4, F-6, H-8, J-10, ?, ?
(a) K-12, M-13 (b) L-12, M-14
(c) L-12, N-14 (d) K-12, M-14
- If in a certain language PRACTICE is coded as PICCTRAE, how is 'FLAMES' coded in that code?
(a) FEMALS (b) FALEMS
(c) FMELAS (d) FALMES
- _cb_ca_bacb_ca_bac_d
(a) addddb (b) addbbb
(c) bddddb (d) bbbddd

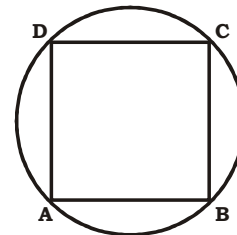
In each of the following questions, a number series is given with one term missing. Choose the correct alternative that will continue the same pattern and fill in the blank spaces.

- 0, 2, 8, 14, (.....), 34
(a) 24 (b) 22
(c) 20 (d) 18
- There are two letters in the word 'DOUBLE' such that the number of letters between them is the same as the number of letters between them in alphabets. Find out both the letters.
(a) D, B (b) E, U
(c) B, E (d) O, L

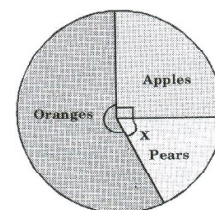
- Which one word can be formed by using the letters of the given word?

C O R R I G E N D U M

- (a) GENDER (b) ERROR
(c) MURDER (d) DANGER
- Rohan ranked eleventh from the top and twenty-seventh from the bottom among the students who passed the annual examinations in a class. If the number of students of students who failed in the exams.was 12, how many students did appear for the examinations?
(a) 48 (b) 49
(c) 50 (d) Can't be determined
- The ratio of number of males to number of females in a club are 7: 4. If there are 84 males in the club, the total number of members in the club are:
(a) 126 (b) 132
(c) 136 (d) 148
- If ABCD is a square whose diagonal is 28 cm, then the ratio of their areas is



- (a) 11 : 7 (b) 11 : 8
(c) 7 : 11 (d) 8 : 11
- If the circumference of a circle is $64x$, then its area is
(a) $\frac{1026x^2}{\pi}$ (b) $\frac{1022x^2}{\pi}$
(c) $\frac{1024x^2}{\pi}$ (d) $\frac{1028x^2}{\pi}$
- The pie chart shows the number of fruits sold in a store. Given that the number of apples is 180 and number of oranges is 400, the value of x , in degrees, is:



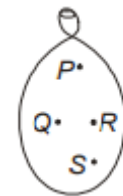
- (a) 60 (b) 70
(c) 160 (d) 200

15. The value of $\sqrt{99} \times \sqrt{396}$ is:
 (a) 208 (b) 198
 (c) 254 (d) None of these
16. If $(3x - 4)(5x + 7) = 15x^2 - ax - 28$ then $a =$ _____
 (a) 1 (b) -1
 (c) -2 (d) none of these
17. The value of $5^{1/4} \times (125)^{0.25}$ is:
 (a) $\sqrt{5}$ (b) 5
 (c) $5\sqrt{5}$ (d) 25
18. $\sqrt{1 + \sqrt{1 + \sqrt{1 + \dots}}} =$ _____
 (a) equals 1
 (b) lies between 0 and 1
 (c) lies between 1 and 2
 (d) is greater than 2
19. The smallest number by which 2560 must be multiplied so that the product is a perfect cube is:
 (a) 5 (b) 25
 (c) 10 (d) 15
20. $[(2\sqrt{2})^x]^{x+1} = (\sqrt{8})^{12}$, then the value of x
 (a) 4 (b) 2
 (c) 3 (d) 521
21. Which of the points below is a point on the x-axis?
 (a) (5, 0) (b) (0, 5)
 (c) (5, 3) (d) (3, 5)
22. The value of $\left(\frac{64}{125}\right)^{\frac{2}{3}} \div \frac{1}{\left(\frac{256}{625}\right)^{\frac{1}{4}}} + \left(\frac{\sqrt{25}}{\sqrt[3]{64}}\right)$ is
 (a) $\frac{5}{2}$ (b) $\frac{5}{3}$
 (c) $\frac{5}{6}$ (d) $\frac{1}{3}$
23. If $x - \frac{1}{x} = 6$ then the value of $x^3 - \frac{1}{x^3}$ is:
 (a) 144 (b) 169
 (c) 234 (d) 269
24. Factors of $27 - 6x - x^2$ are:
 (a) $(3 - x)(9 + x)$
 (b) $(x - 3)(x + 9)$
 (c) $(x - 2)(x + 7)$
 (d) None of these
25. A certain number of men can finish a piece of work in 100 days. If, there were 10 men less, it would take 10 days more for the work to be finished. How many men were there originally?
 (a) 75 (b) 82
 (c) 100 (d) 110

SECTION B

(ON MATHEMATICS)

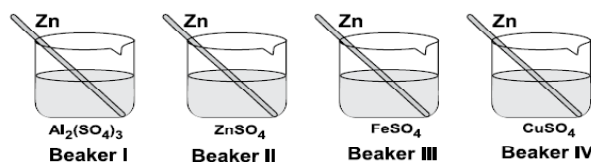
1. The balloon shown here is filled with water. Ashish wants to make a hole in the balloon so that water comes out with maximum pressure. At which point should he make the hole?



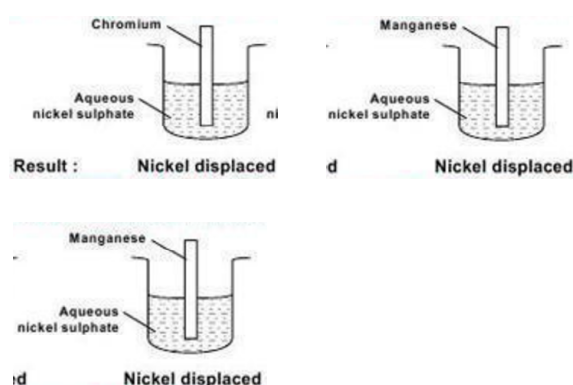
- (a) P
 (b) Q
 (c) R
 (d) S
2. The motion of a striker across a carom board is an example of _____ type of motion.
 (a) Periodic (b) Oscillatory
 (c) Circular (d) Rectilinear
3. The voice of which of the following is likely to have minimum frequency?
 (a) Baby girl (b) Baby boy
 (c) A man (d) A woman
4. A ball placed on a table starts coming down the slope when the table is tilted. Which is the force that causes this motion?
 (a) Friction
 (b) Push by table
 (c) Rolling force
 (d) Gravitational pull by earth

5. Frictional force on an object in a fluid does not depend on
- Speed of the object relative to fluid
 - Shape of the object
 - Nature of the fluid
 - None of these
6. An object vibrates with a frequency 15 Hz. Which of the following is true?
- It produces sound which we can hear.
 - It does not produce sound.
 - It produces sound which we cannot hear.
 - It produces sound which we can hear if we strain our ears.
7. A body immersed in a fluid experiences an upward thrust which is equal to :
- The weight of the fluid displaced by it
 - The volume of the body
 - The mass of the body
 - All of these.
8. Arrange the following planets in increasing order of time required to complete one revolution around Sun.
- Earth
 - Uranus
 - Mars
 - Jupiter
- (i), (ii), (iii), (iv)
 - (i), (iii), (iv), (ii)
 - (iv), (iii), (ii), (i)
 - (ii), (iii), (i), (iv)
9. When we use biomass to generate electricity the conversion of energy is from ____.
- Chemical to electrical energy
 - Kinetic to electrical energy
 - Nuclear to electrical energy
 - Muscular to electrical energy
10. We can cover the jewellery made of less expensive metals, with layer of gold or silver, by ____.
- Electroplating
 - Earthing
 - Charging
 - Simply dipping in gold solution.
11. Ritika noted the initial colour of the solutions in beakers I, II, III and IV. After inserting zinc rods in each solution and leaving undisturbed for two hours, she noted the colour of each solution again. Mark the beakers in which colour

change is observed?



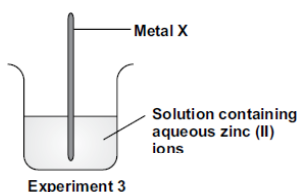
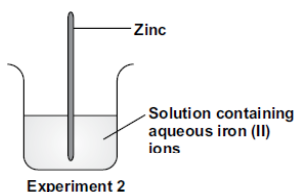
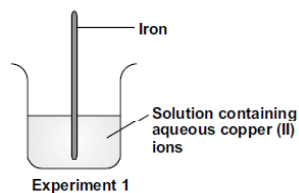
- I and II
 - II and III
 - III and IV
 - I and IV
12. Sudha took a small amount of sulphur in deflagrating spoon and heated it over a burner. As soon as it started burning she put it in a gas jar and covered with a lid. After sulphur stopped burning she added a small amount of water in it and dissolved the gas in water by shaking it. She then tested the solution with red and blue litmus paper. What did she observe?
-
- In the solution the blue litmus paper turned red.
 - In the solution the red litmus paper turned blue.
 - There was no change in the colour of litmus paper.
 - Blue litmus paper turned red and red litmus paper turned blue.
13. Three experiments to investigate the reactivities of three metals are shown



What is the correct order of reactivity (most reactive → least reactive) for these three metals?

- Chromium, Manganese, Nickel
- Manganese, Chromium, Nickel
- Manganese, Nickel, Chromium
- Nickel, Chromium, Manganese

14. A student investigated the reactivity of four metals - iron, copper, zinc and an unknown metal X. He arranged three experimental set up as shown in the diagram.



The student observes that reaction occurred in all the three experiments. Identify the metal X.

- (a) Cu (b) Mg
(c) Fe (d) Au

15. Match the following :

Column-I	Column II
1. Rapid combustion	(p) Materials get ignited without any apparent cause
2. Spontaneous	(q) Fuel burns rapidly and combustion produces heat and light
3. Explosion	(r) Fire extinguisher
4. Sodium carbonate	(s) Evolution of large amount of heat, light and sound

- (a) 1 - (q), 2 - (p), 3 - (s), 4 - (r)
(b) 1 - (p), 2 - (q), 3 - (r), 4 - (s)
(c) 1 - (r), 2 - (s), 3 - (q), 4 - (p)
(d) 1 - (s), 2 - (r), 3 - (q), 4 - (p)

16. Few properties of gases X, Y and Z are given.
Gas X : An extremely suffocating and corrosive gas, released by burning coal and diesel.
Gas Y : Given off by petrol engines
Gas Z : Produced by incomplete combustion of fuels
Identify gases X, Y and Z respectively on the basis of the given properties.

- (a) CO_2 , H_2 , SO_2 (b) SO_2 , NO_x , CO
(c) NO_x , SO_2 , CO (d) H_2 , SO_2 , CO

17. Which of the following is the best extinguisher for inflammable materials?

- (a) Water (b) Sulphur dioxide
(c) Carbon dioxide (d) Carbon monoxide

18. Silk is obtained from ____ of the silk moth.

- (a) pupa (b) larva
(c) cocoon (d) caterpillar

19. Nylon is obtained from:

- (a) coal (b) air
(c) water (d) all of the above

20. Match Column-I with Column-II and select the correct option from the codes given below.

Column-I	Column-II
(i) A synthetic fibre obtained from cellulose	(p) Acrylic
(ii) A synthetic fibre used for making woollen clothes	(q) Nylon
(iii) A thermosetting plastic	(r) Rayon
(iv) This polymer is used for making ropes and fishing nets	(s) Bakelite

(a) (i)-(p); (ii)-(q); (iii)-(r); (iv)-(s)
(b) (i)-(r); (ii)-(p); (iii)-(s); (iv)-(q)
(c) (i)-(s); (ii)-(r); (iii)-(q); (iv)-(p)
(d) (i)-(p); (ii)-(r); (iii)-(q); (iv)-(s)

21. The two micro-organisms which live in symbiotic association in lichens are

- (a) fungus and protozoa
(b) alga and bacteria
(c) bacteria and protozoa
(d) alga and fungus

22. During the process of exhalation, the ribs move

- (a) down and inwards.
(b) up and inwards.
(c) down and outwards.
(d) up and outward.

23. They are pipe-like, consisting of a group of specialised cells. They transport substances and form a two-way traffic in plants. Which of the following terms qualify for the features mentioned above?
- (a) Xylem tissue (b) Vascular tissue
(c) Root hairs (d) Phloem tissue
24. Which of the following statement is not true for organic manure?
- (a) It enhances water holding capacity of soil.
(b) It has a balance of all plant nutrients.
(c) It provides humus to soil.
(d) It improves texture of soil.
25. Read the different combinations of terms given below. The correct combination of terms with reference to an animal cell is ____.
- (a) cell wall, cell membrane, nucleus, plastid
(b) cell wall, nucleus, ribosome, chromosome
(c) cell membrane, mitochondria, ribosome, chromosome
(d) cell membrane, ribosome, mitochondria, chloroplast.
26. Choose the correct statement:
- (a) Genes are located in the chromosomes.
(b) Cell is located in the nucleus.
(c) Chromosomes are located in the nucleolus.
(d) Cell membrane surrounds the nucleus
27. The gas released during the preparation of bread is
- (a) oxygen (b) carbon dioxide
(c) nitrogen (d) sulphur dioxide
28. The most important function of cell membrane is that it:
- (a) controls the entry and exit of materials from cells.
(b) controls only the entry of materials into cells.
(c) controls only the exit of materials from cells.
(d) allows entry and exit of materials without any control.
29. Read the statements given below.
- (i) Seeds require moisture for germination.
(ii) Plants can absorb nutrients mostly in dissolved form.
(iii) Irrigation protects crops from both frost and hot air currents.
(iv) Irrigation improves soil texture.
- Choose the combination of statements which indicate the need to irrigate crops.
- (a) i and ii (b) i, ii, iii
(c) i, ii, iii, iv (d) i and iii
30. Breathing is a process that
- (i) provides O_2 to the body.
(ii) breaks down food to release energy.
(iii) helps the body to get rid of CO_2 .
(iv) produces water in the cells.
- Which of the following gives the correct combination of functions of breathing?
- (a) (i) and (ii) (b) (ii) and (iii)
(c) (i) and (iii) (d) (ii) and (iv)