

IIT ASHRAM BRINGS...



CLASS **7**

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)**

- Adult : Baby :: Flower : ?
(a) Seed (b) Bud
(c) Fruit (d) Butterfly
- Often : Always :: Seldom : ?
(a) Never (b) Ever
(c) Sometimes (d) Now
- Which number would replace question mark in the series 7, 12, 19, ?, 39.
(a) 29 (b) 28
(c) 26 (d) 24
- Which is the number that comes next in the sequence : 0, 6, 24, 60, 120, 210 ?
(a) 240 (b) 290
(c) 336 (d) 504
- 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

17	15	8
99	95	64
36	45	?

- | | |
|----|---|
| 5 | 3 |
| 19 | |
| 4 | |

A

7	5
?	
6	

B

6	4
29	
5	

C

(a) 25 (b) 37
(c) 41 (d) 47
- 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

- 3, 6, 5, 20, 7, 42, 9, (.....)
(a) 54 (b) 60
(c) 66 (d) 72
- 1, 3, 4, 8, 15, 27, (.....)
(a) 37 (b) 44
(c) 50 (d) 55
- In the continued proportion 1, 5, x; x is equal to.
(a) 20 (b) 10
(c) 25 (d) 15
- To make a certain sweet, the needed ratio of sugar to flour is 2 : 3. If 45 kg of flour is being used, the required quantity of sugar is.....
(a) 40 kg (b) 25 kg
(c) 30 kg (d) 10 kg
- 152 books can be packed in 19 boxes. so, to pack 72 books, the number of boxes needed is.....
(a) 9 (b) 18
(c) 27 (d) none of these
- The standard form of $\frac{28}{-70}$ is
(a) $\frac{-2}{5}$ (b) $\frac{-28}{70}$
(c) $\frac{-5}{2}$ (d) $\frac{-4}{10}$
- The sum of two rational numbers is - 3. If one of the number is $\frac{-10}{3}$, the other number is____
(a) $\frac{11}{3}$ (b) $\frac{-17}{3}$
(c) $\frac{-1}{3}$ (d) $\frac{1}{3}$
- Two supplementary angles are in the ratio 7 : 11, then the angles are____.
(a) 70°, 120° (b) 60°, 120°
(c) 70°, 110° (d) 50°, 130°
- If the area of a triangle with base x is equal to the area of a square with side x, then the length of altitude of the triangle is____
(a) $\frac{x}{2}$ (b) x
(c) 2x (d) 3x

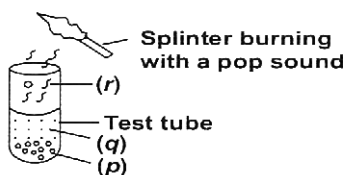
18. Two numbers are in the ratio of 1 : 2. If 7 be added to both, their ratio changes to 3 : 5. The greater number is ____.
- (a) 28 (b) 32
(c) 36 (d) 25
19. What is 50% of a number whose 200% is 20?
- (a) 5 (b) 10
(c) 15 (d) 20
20. The value of $ax^2 + bx + c$ at $x = \frac{-b}{a}$ is ____.
- (a) a (b) $b^2 - 4ac$
(c) c (d) 0
21. A factor of $(3x^4 - 12y^4)$ is ____.
- (a) 3 (b) $x^2 - 2y^2$
(c) $x^2 + 2y^2$ (d) all of these
22. If $\left(\frac{1}{5}\right)^{3y} = 0.008$, then $(0.25)^y$ will be ____.
- (a) 1 (b) 0.0625
(c) 0.25 (d) 0.125
23. The value of $(9^{4/3} \div 27^{2/3}) \times 3^{3/2}$ is ____.
- (a) $3^{13/6}$ (b) $3^{9/5}$
(c) $3^{37/6}$ (d) 3^4
24. The quotient when 0.00639 is divided by 0.213 is ____.
- (a) 0.3 (b) 0.03
(c) 0.003 (d) 3
25. The value of x in $-19 \times (4 + (-2)) = -19 \times 4 + (-19) \times x$ is ____.
- (a) 2 (b) -19
(c) 4 (d) -2

SECTION B**(ON MATHEMATICS)**

1. Mercury is used as a thermometer substance because
- (a) It is very costly
(b) It expands less than glass
(c) It does not wet the wall of the glass tube
(d) None of the above
2. During the formation of rain, when water vapour changes back to liquid in the form of rain drops
- (a) Heat is absorbed
(b) Heat is released
(c) Heat is first absorbed and then released
(d) There is no exchange of heat
3. Air exerts pressure in
- (a) Downward direction only
(b) Upward direction only
(c) Sideways only
(d) All directions
4. Earthing is provided in buildings to protect it from
- (a) Lightning
(b) Leakage of electric current
(c) Cyclone
(d) Thunderstorm
5. If a body moves with uniform velocity, then
- (a) Its initial velocity is zero
(b) Its final velocity is zero
(c) Its acceleration is non-zero
(d) Its change in velocity is zero
6. A scooterist covers a distance of 3 km in 5 minutes. He travels with a speed of
- (a) 100 m/s (b) 360 km/h
(c) 100 cm/s (d) 600 m/min
7. On holding a stainless steel spoon near our face, we see
- (a) Our inverted image on outer side of the spoon
(b) Our erect image on inner side of the spoon
(c) Our inverted image on inner side of the spoon
(d) Our laterally inverted image on inner side of the spoon

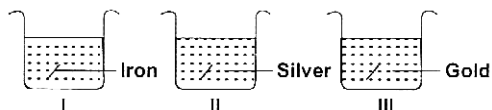
8. In lateral inversion
- Right side of the object will be right side of the image
 - Left side of the object will be left side of the image
 - Upside of the object will be down side of the image
 - Right side of the object will be left side of the image
9. The increase in area of the solid on heating is called
- Superficial expansion
 - Linear expansion
 - Cubical expansion
 - Quadra expansion
10. The temperature at which no more energy can be removed from matter is called
- Absolute zero
 - Boiling point
 - 32° F
 - 32°C

11. Observe the figure and identify the substances marked by (p), (q) and (r).



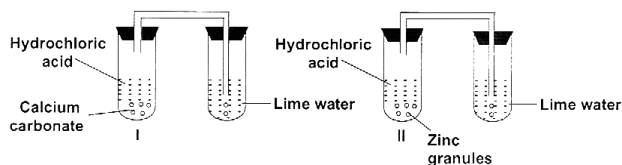
- | (p) | (q) | (r) |
|---------------|-------------------|----------------|
| (a) Zinc | Water | Carbon dioxide |
| (b) Magnesium | Hydrochloric acid | Oxygen |
| (c) Magnesium | Water | Carbon dioxide |
| (d) Zinc | Hydrochloric acid | Hydrogen |

12. Vishakha took few wire pieces made up of different metals and placed them in blue solution of copper sulphate. What will be the changes in the colour of the solutions present in beakers I, II and III?



- | I | II | III |
|-----------|-------|-------|
| (a) Green | Blue | Green |
| (b) Blue | Green | Green |
| (c) Green | Blue | Blue |
| (d) Blue | Blue | Blue |

13. Kanav took two test tubes marked as I and II. In test tube I, he put calcium carbonate and hydrochloric acid while in test tube II, he put zinc granules and hydrochloric acid. He passed the gas coming out from both the test tubes in lime water. What are his observations?



- The gas coming out from test tube I turns lime water milky.
 - The gas coming out from test tube II turns lime water milky.
 - The gases coming out from both the test tubes turn lime water milky.
 - None of these
14. Acetic acid + Sodium hydrogen carbonate
→ (i)



What could (i) and (ii) be?

- (i) CaCO_3 ; (ii) CO_2
 - (i) H_2O ; (ii) CaCO_3
 - (i) CO_2 ; (ii) CaCO_3
 - (i) H_2O ; (ii) CO_2
15. $\text{Na}_2\text{CO}_3 + 2\text{HCl} \rightarrow ?$
- $\text{NaCl} + \text{O}_2 + \text{H}_2$
 - $\text{NaCl} + \text{O}_2$
 - $\text{NaCl} + \text{H}_2\text{O}$
 - $2\text{NaCl} + \text{CO}_2 + \text{H}_2\text{O}$
16. Lime water is a solution of:
- Ca(OH)_2 in water
 - CaCl_2 in water
 - NaOH in water
 - NaCl in water

17. Study the table carefully :

Which of the above are correctly matched ?

Sample	Blue litmus to red	Red litmus to blue
(i) Tamarine juice	✓	×
(ii) Sugar syrup	×	✓
(iii) Lime water	×	✓
(iv) Soap solution	✓	×

(a) (i) & (iii) (b) (ii) & (iv)
 (c) (i), (ii) & (iii) (d) (i), (iii) & (iv)

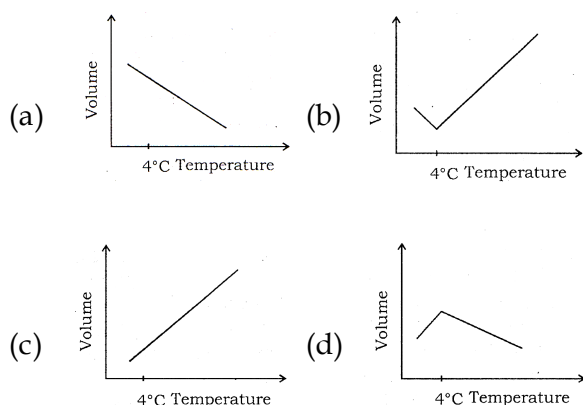
18. Five solutions have been taken in five test tubes labelled as A, B, C, D and E. They are tested with four indicators and the observations are recorded.

Solution	Methyl Orange	Blue litmus	Red litmus	Phenolphthalein
A	Red	Red	Red	Colourless
B	Red	Red	Red	Colourless
C	Yellow	Blue	Blue	Pink
D	Orange	Blue	Red	Colourless
E	Red	Red	Red	Colourless

Which of the above solutions can neutralise each other?

- (a) A and B (b) D and E
 (c) B and C (d) B and D

19. Which of the following correctly shows the expansion of water with rise in temperature?



20. Ravi was given four liquids, 1, 2, 3 and 4. He took each liquid at a time and poured some of it in four beakers filled with water. He observed the following _____

Liquid 1 + water gives immiscible liquid, Liquid 2 + water gives miscible liquid

Liquid 3 + water gives immiscible liquid, Liquid 4 + water gives miscible liquid

What could liquids 1, 2, 3, and 4, respectively be?

	1	2	3	4
(A) Ink		juice	milk	kerosene
(B) Kerosene		milk	ink	mustard oil
(C) Mustard oil		milk	kerosene	ink
(D) Milk		ink	juice	kerosene

21. The maximum and minimum temperature displayed daily in the weather bulletin refer to the -

- (a) highest day temperature and lowest night temperature of the day.
 (b) highest day temperature and highest night temperature of the month.
 (c) temperature recorded at 12 noon and at mid night (00.00 hrs).
 (d) average highest temperature of day and average lowest temperature of night.

22. Sometimes when we do heavy exercise, anaerobic respiration takes place in our muscle cells. What is produced during this process?

- (a) alcohol and lactic acid
 (b) alcohol and CO₂
 (c) lactic acid and CO₂
 (d) lactic acid only

23. In the absence of which of the following will photosynthesis not occur in leaves?

- (a) Guard cells (b) Chlorophyll
 (c) Vacuole (d) Space between cells

24. Which of the following organisms does not have both muscles and skeleton for movement?

- (a) dog (b) snail
 (c) earthworm (d) human being

25. The method of preparing compost with the help of earthworms is called
- (a) composting (b) vermicomposting
(c) manuring (d) decomposing
26. Which of the following statement is incorrect for penguins?
- (a) They huddle together
(b) They cannot swim
(c) They have webbed feet
(d) They have streamlined body
27. The swallowed food moves downwards in the alimentary canal because of
- (a) force provided by the muscular tongue.
(b) the flow of water taken with the food.
(c) gravitational pull.
(d) the contraction of muscles in the wall of food pipe.
28. Which of the following activities does not reflect responsible behaviour with regard to waste disposal?
- (a) Goods carried in paper bags or cloth bags.
(b) Waste collected in polythene bags for disposal.
(c) Waste separated into those that degrade and those that do not.
(d) Making handicrafts with used up notebooks.
29. The finger-like outgrowths of *Amoeba* helps to ingest food. However, the finger-like outgrowths of human intestine helps to
- (a) digest the fatty food substances.
(b) make the food soluble.
(c) absorb the digested food.
(d) absorb the undigested food.
30. Which of the following statements is/are correct?
- (i) All green plants can prepare their own food.
(ii) Most animals are autotrophs.
(iii) Carbon dioxide is not required for photosynthesis.
(iv) Oxygen is liberated during photosynthesis.
- Choose the correct answer from the options below:
- (a) (i) and (iv) (b) (ii) only
(c) (ii) and (iii) (d) (i) and (ii)