

# IIT ASHRAM BRINGS...



CLASS

6

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 :

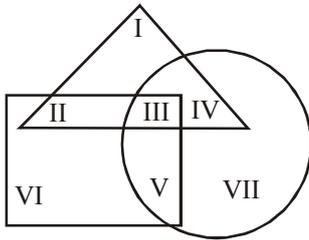
8. For each question in **Section A & B** you will be **awarded 4 marks** if you have darkened only the bubble corresponding to the correct answer and zero mark if no bubble is darkened. In all other cases, **minus one (-1) mark** will be awarded.



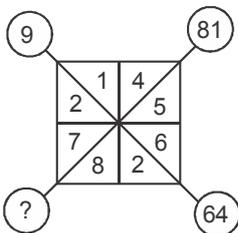
## SECTION A

### (ON MENTAL ABILITY)

- A man is facing south. He turns  $135^\circ$  in the anticlockwise direction and then  $180^\circ$  in the clockwise direction. Which direction is he facing now ?  
 (a) North-east      (b) North-west  
 (c) South-east      (d) South-west
- The triangle, Square and circle shown below respectively represent the urban, hard working and educated people. Which one of the areas marked I-VII is represented by the urban educated people who are not hard working ?



- II
  - I
  - IV
  - III
- Introducing Asha to guests, Bhaskar said, "Her father is the only son of my father." How is Asha related to Bhaskar ?  
 (a) Daughter      (b) Mother  
 (c) Sister      (d) Niece
- 'Fan' is related to 'Wings' in the same way as 'Wheel' is related to-  
 (a) Round      (b) Cars  
 (c) Spokes      (d) Moves
- 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



7.

(a) 225      (b) 117

(c) 256      (d) 123

8. Find the odd-man out?

(a) DEHG      (b) RSVU

(c) XYBA      (d) LMQP

9. Y, W, U, S, Q, ?, ?

(a) N, J      (b) M, L

(c) J, R      (d) O, M

10. AZ, CX, FU, ?

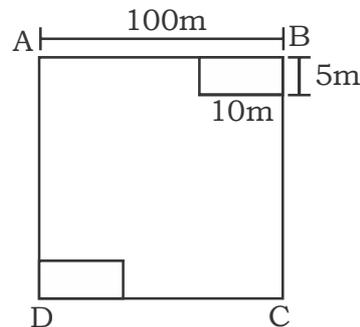
(a) IR      (b) IV

(c) JQ      (d) KP

11. 152 books can be packed in 19 boxes. so, to pack 72 books, the number of boxes needed is.....

(a) 9      (b) 18

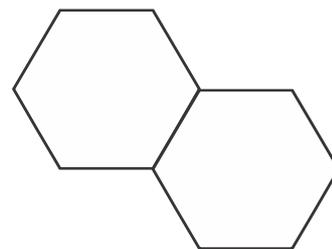
(c) 27      (d) none of these

12. A square shaped park ABCD of side 100m has two equal rectangular flower beds each of size. 10m  $\times$  5m(Fig.) Length of the boundary of the remaining park is

(a) 360m      (b) 400m

(c) 340m      (d) 460m

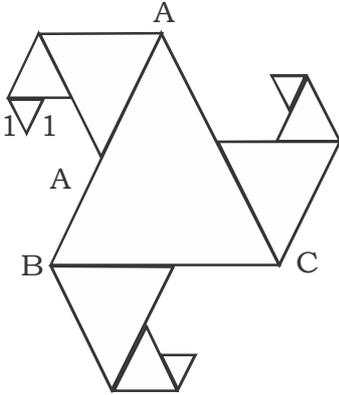
13. Two regular Hexagons of perimeter 30cm each are joined as shown in fig. The perimeter of the new figure is



(a) 65 cm      (b) 60 cm

(c) 55cm      (d) 50cms

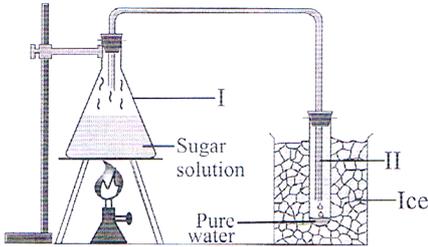
14. In fig., all triangles are equilateral and  $AB = 8$  units. Other triangles have been formed by taking the mid points of the sides. What is the perimeter of the figure?



- (a) 66 unit                      (b) 45 unit  
(c) 60 unit                      (d) None
15. A wire is cut into several small pieces. Each of the small pieces is bent into a square of side 2cm. If the total area of the small squares is 28 square cm. What was the original length of the wire?
- (a) 50 cm                      (b) 40 cm  
(c) 56 cm                      (d) 21 cm
16. If each match box contains 50 matchsticks, the number of matchsticks required to fill  $n$  such boxes is
- (a)  $50 + n$                       (b)  $50 \div n$   
(c)  $50n$                       (d)  $50 - n$
17. Savitri has a sum of Rs  $x$ . She spent Rs. 1000 on grocery, Rs 500 on clothes and Rs. 400 on education, and received Rs. 200 as a gift. How much money (in Rs) is left with her?
- (a)  $x - 1700$                       (b)  $x - 1900$   
(c)  $x + 200$                       (d)  $x - 2100$
18. In a village, there are 8 water tanks to collect rain water. On a particular day,  $x$  litres of rain water is collected per tank. If 100 litres of water was already there in one of the tanks, what is the total amount of water in the tanks on the day?
- (a)  $2x + 100$  L                      (b)  $5x + 100$  L  
(c)  $8x + 50$  L                      (d)  $8x + 100$  L
19. There are 'b' boys and 'g' girls in a class. The ratio of the number of boys to the total number of student in the class is:
- (a)  $\frac{b}{b-g}$                       (b)  $\frac{b}{b+g}$   
(c)  $\frac{b}{g}$                       (d)  $\frac{b+g}{b}$
20. If a bus travels 160 km in 4 hours and a train travels 320 km in 5 hours at uniform speeds, then the ratio of the distances travelled by them in one hour is
- (a) 1 : 2                      (b) 4 : 5  
(c) 5 : 8                      (d) 8 : 5
21. A recipe calls for 1 cup of milk for every  $2\frac{1}{2}$  cups of flour to make a cake that would feed 6 persons. How many cups of both flour and milk will be needed to make a similar cake for 8 people?
- (a)  $4\frac{2}{3}$                       (b)  $5\frac{1}{3}$   
(c)  $3\frac{1}{8}$                       (d)  $6\frac{1}{4}$
22. The earth rotates  $360^\circ$  about its axis in about 24 hours. By how much degree will it rotate in 2 hours?
- (a)  $60^\circ$                       (b)  $30^\circ$   
(c)  $45^\circ$                       (d)  $80^\circ$
23. If the number  $7254^*98$  is divisible by 22, the digit at \* is
- (a) 2                      (b) 3  
(c) 6                      (d) 0
24. The sum of the prime factors of 1729 is
- (a) 13                      (b) 19  
(c) 32                      (d) 39
25. The product of the place value of two 2's in 428721 is
- (a) 4                      (b) 40000  
(c) 400000                      (d) 40000000

**SECTION B****(ON MATHEMATICS)**

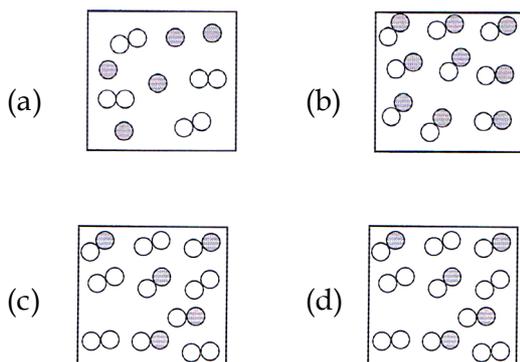
1. When no more salt can be dissolved in water at a particular temperature then the solution at that temperature is called
  - (a) Unsaturated
  - (b) Saturated
  - (c) Sometimes saturated sometimes unsaturated
  - (d) None of the above
2. In which of the following cases the heat energy is given out?
  - (i) When water boils
  - (ii) When ice melts
  - (iii) When water freezes to ice
  - (iv) When water vapour condenses to water
  - (a) In (i), (ii) & (iii)
  - (b) In (iii) only
  - (c) In (iv) only
  - (d) In both (iii) & (iv)
3. Which of the following changes can be reversed?
  - (a) Batter to idli
  - (b) Bud to flower
  - (c) Cowdung to biogas
  - (d) Ice-cream to molten ice-cream
4. Earthing is provided in buildings to protect it from
  - (a) Lightning
  - (b) Leakage of electric current
  - (c) Cyclone
  - (d) Thunderstorm
5. Spinning of a top is an example of
  - (a) Rotatory motion
  - (b) Translatory motion
  - (c) Vibratory motion
  - (d) Oscillatory motion
6. The motion of the arms of a soldier marching along the road is
  - (a) Circular
  - (b) Oscillatory
  - (c) Rotatory
  - (d) Non periodic
7. Which of the following is/are examples of rectilinear motion?
  - (a) A train moving on a straight railway track
  - (b) A freely falling stone
  - (c) A coin moving over a carom board
  - (d) All of the above
8. What happens when light falls on a wooden chair?
  - (a) Light is reflected from the chair to our eyes
  - (b) Light passes through the wooden chair
  - (c) The chair sends a chemical signal to our eyes that enables us to see it
  - (d) Energy is given out by the chair
9. The essential condition for the formation of shadow is
  - (a) There should be an opaque material
  - (b) There should be a source of light and screen
  - (c) The object must be placed in the path of light
  - (d) All of these
10. A tester is used by the electrician to determine
  - (a) The presence of electric current
  - (b) The temperature
  - (c) The amount of electric current
  - (d) The rate of flow of electric current
11. The given figure shows the apparatus used to obtain pure water from sugar solution :
 



The processes occurring in apparatus I and II are respectively

- (a) Boiling and vaporisation
- (b) Sublimation and evaporation
- (c) Boiling and condensation
- (d) Melting and condensation

12. Which one of the following diagrams represents and example of an element-element mixture?



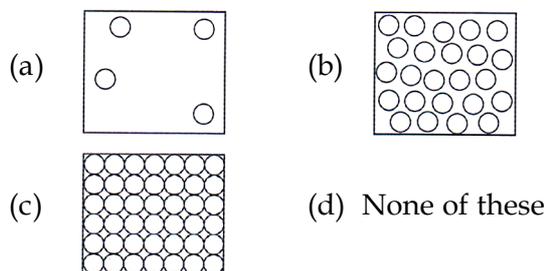
13. Match the Column I with Column II and select the correct option from the given codes.

**Column I****Column II**

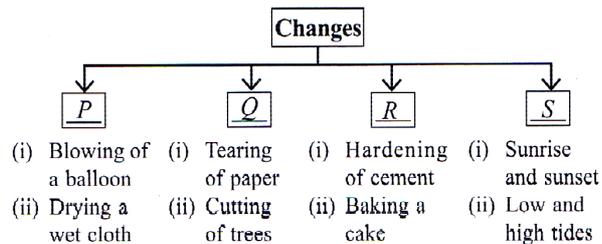
- |   |                      |
|---|----------------------|
| P. Cleaning muddy water                                     | 1. Winnowing         |
| Q. Separating sand from gravel                              | 2. Filtration        |
| R. Separating chaff from the grains                         | 3. Separating funnel |
| S. Separating kerosene from a mixture of kerosene and water | 4. Sieving           |

- |     | P | Q | R | S |
|-----|---|---|---|---|
| (a) | 4 | 2 | 1 | 3 |
| (b) | 2 | 4 | 3 | 1 |
| (c) | 3 | 2 | 1 | 4 |
| (d) | 2 | 4 | 1 | 3 |

14. A solid substance 'X' sublimes at 950C. Which of the following figures represents the arrangement of particles of 'X' at 1000C?



15. Read the given flowchart carefully and fill in the blanks by choosing an appropriate option.



Identify P,Q,R and S.

- |     | P                     | Q                     | R                     | S            |
|-----|-----------------------|-----------------------|-----------------------|--------------|
| (a) | Irreversible physical | Chemical              | Periodic              | Non-periodic |
| (b) | Reversible physical   | Irreversible physical | Irreversible Chemical | Periodic     |
| (c) | Reversible physical   | Chemical              | Non-Periodic          | Periodic     |
| (d) | Reversible            | Chemical              | Irreversible          | Non-periodic |

16. Which of these is a chemical change?

- (a) Candle wax melting  
 (b) Candle wax burning  
 (c) Icecream melting  
 (d) Cooling water

17. Hydrogen and Oxygen combining to form water is an example of:

- (a) Slow change (b) Chemical change  
 (c) Physical change (d) Natural change

18. Match the following:

- | Column 'A'      | Column 'B'             |
|-----------------|------------------------|
| (p) Xenon       | (i) liquid non-metal   |
| (q) Fluorine    | (ii) noble gas         |
| (r) Bromine     | (iii) solid non-metal  |
| (s) Phosphorous | (iv) gaseous non-metal |
- (a) p(iv), q(ii), r(iii), s(i)  
 (b) p(i), q(iv), r(ii), s(iii)  
 (c) p(iii), q(iv), r(ii), s(i)  
 (d) p(ii), q(iv), r(i), s(iii)

19. Which of the following noble gas is used to fill in weather observatory balloons?

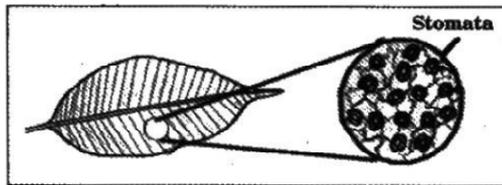
- (a) He (b) Ar  
 (c) Ne (d) Kr

20. The molecular formula of Baking soda is

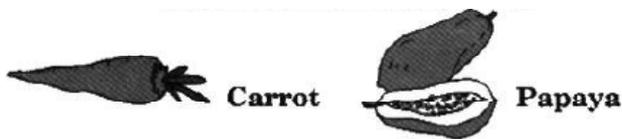
- (a)  $\text{Na}_2\text{CO}_3$  (b)  $\text{NaCO}_3$   
 (c)  $\text{NaHCO}_3$  (d)  $\text{NaHCO}_2$

21. Which of the following is not a stem.

- (a) Potato (b) Turmeric  
(c) Sweet potato (d) Ginger
22. I anchor the plant to the ground. I absorb water and mineral salts from the soil. Who am I?  
(a) Root (b) Stem  
(c) Leaf (d) Flower
23. Which of the following adaptations help a polar bear to survive in the Arctic region?  
(i) Thick white fur to camouflage itself  
(ii) Thick layer of fat under its skin  
(iii) Flippers to enable it to swim fast and catch its prey  
(a) Only (i) and (iii) (b) Only (ii) and (iii)  
(c) Only (i) and (ii) (d) (i), (ii) and (iii)
24. The diagram shows stomata, which are usually found on the surface of leaf ?



- (a) back side (b) front side  
(c) both (a) and (b) (d) none
25. The figure given shows some food items.



Which of the following vitamins is present in the given food?

- (a) Vitamin A (b) Vitamin B  
(c) Vitamin C (d) Vitamin D
26. Read the statement given below and identify who I am.  
"I protect the brain. I consist of bones which are fused firmly together to form shell like structure".  
(a) Ribcage  
(b) Skull  
(c) Vertebral column  
(d) Ligament

27. Which of the following sequences is arranged correctly in an increasing order of complexity in a multicellular organism?  
(a) Tissue ~ Cell ~ Organ ~ System  
(b) Organ ~ System ~ Tissue ~ Cell  
(c) Cell ~ Tissue ~ Organ ~ System  
(d) System ~ Cell ~ Tissue ~ Organ
28. Which of the following sets of animals have streamlined body, that helps in easy movement of the animal ?  
(a) Snake and crocodile  
(b) Cockroach and snail  
(c) Fish and bird  
(d) Snake and snail.
29. Two different animals have the following characteristics in common.

- ♦ They are aquatic-animals.
- ♦ They give birth to their young ones and suckle them.
- ♦ They have blow holes and breathe through lungs.

The animals are likely to be

- (a) a turtle and a frog.  
(b) a sword fish and a shark.  
(c) a dolphin and a whale.  
(d) a turtle and a penguin.
30. Which one of the following groups of animals includes only omnivores?  
(a) Man, Sparrow, Goat, Elephant  
(b) Lion, Lizard, Rabbit, Deer  
(c) Ant, Man, Crow, Rat  
(d) Camel, Snake Lizard, Cow