



SAMPLE QUESTION PAPER

TIME : 2 HOURS

SCIENCE APTITUDE TEST

MAX MARKS : 300

Important Instructions

1. This Question paper contains 4 Parts
Part - I : Mental Ability - 15 Questions | Part - II : Mathematics - 30 Questions | Part - III : Physics & Chemistry - 20 Questions | Part - IV : Biology - 10 Questions
2. Marking Scheme: For each correct answer 4 marks will be awarded and for each wrong answer -1 mark will be deducted. In case of no response zero mark will be awarded
3. There is only one correct answer for each Question.
4. Darken the appropriate circle completely for the correct answer.
5. Use blue/black ballpoint pen only.
6. Fill in all the personal details given in the OMR sheet in the space provided.
7. Rough work is to be done in the space provided for this purpose in the Test Booklet only



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PART - I : MENTAL ABILITY

1. Find the missing term(s):

2, 6, 12, 20, 30 ?

- (a) 36 (b) 40
(c) 42 (d) 44

2. If CAT = 24, DOG = 26 then BAT = ?.

- (a) 20 (b) 21
(c) 22 (d) 23

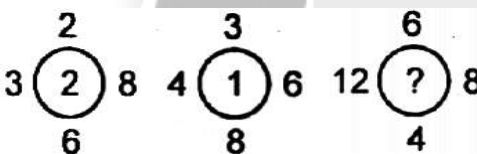
3. Analogy Tree: Leaf: Book: ?

- (a) Page (b) Story
(c) Cover (d) Library

4. In each example on some letters are missing shown by (). The missing letters are given in proper sequence as one of the five alternatives given under each question. Find out the correct alternative.

a _ _ baa _ _ baa _ _ ba

- (a) aab (b) bab
(c) bba (d) bbb

5. 

- (a) 3 (b) 4
(c) 5 (d) 6

- 6.

	3			5			5	
6	10	2	9	30	3	6	?	5
	4			5			2	

- (a) 15 (b) 20
(c) 25 (d) 40

7. A man is facing west. He turns 45° in the clockwise direction and then another 180° in the same direction and then 270° in the anticlockwise direction. Which direction is he facing now ?

- (a) South (b) North-West
(c) West (d) South-West

8. If GOOD is written HQRH, how will you write DREAM ?

- (a) ESPBN (b) ETHER
(c) ETHPQ (d) ESHDR

9. If air is called water, water is called green, green is called dust, dust is called yellow and yellow is called cloud, which of the following does fish live in ?

- (a) Air (b) Water
(c) Green (d) Dust

10. If the first and second letters in the word DEPRESSION were interchanged, also the third and the fourth letters, the fifth and the sixth letters and so on, which of the following would be the seventh letter from the right ?

- (a) R (b) O
(c) S (d) None of these

Space for Rough Work

PART - II : MATHEMATICS

11. Akash said to Mohit, "That boy in blue shirt is younger of the two brothers of the daughter of my father's wife". How is the boy in blue shirt related To Aakash".

- (a) Father (b) Uncle
(c) Brother (d) Nephew

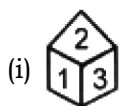
12. If $3@2 = 13$, $4@3 = 25$ then $5@4 = ?$

- (a) 37 (b) 41
(c) 43 (d) 45

13. Ajay left home for the bus stop 15 minutes earlier than usual. It takes 10 minutes to reach the stop. He reached the stop at 8.40 a.m. What time does he usually leave home for the bus stop?

- (a) 8.30 a.m. (b) 8.45 a.m.
(c) 8.55 a.m. (d) Data inadequate

14. What should be the number opposite 4 ?



- (a) 5 (b) 1
(c) 3 (d) 2

15. Bank is related to Money in the same way as Transport is related

- (a) Goods (b) Road
(c) Terrace (d) Floor

1. Evaluate:

$$|4 - [1 + 5 \{12 \div 4 - 2(1 - \overline{4 - 3})\}]|$$

- (a) -14 (b) 12
(c) 28 (d) 17

2. If $a = 2$ and $b = 3$, then value of $\left(\frac{1}{a} + \frac{1}{b}\right)^a$.

- (a) $\frac{25}{36}$ (b) $\frac{24}{26}$
(c) $\frac{75}{26}$ (d) $\frac{25}{26}$

3. Which of the following statement is false?

- i. Every fraction is a rational number
ii. Every rational number is a fraction
iii. Every integer is a rational number
iv. All the above

- (a) Option (iii) (b) Option (i)
(c) Option (iv) (d) Option (ii)

4. If $\frac{x}{pq} + \frac{x}{qr} + \frac{x}{pr} = p + q + r$, then $x =$

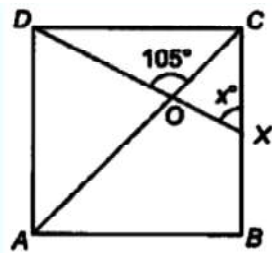
- (a) $\frac{pq}{r}$ (b) $\frac{q}{pr}$
(c) pqr (d) $\frac{p}{qr}$

Space for Rough Work

5. The number of boys and girls in a class is in the ratio 7:5. The number of boys is 8 more than the number of girls. What is the total class strength?

(a) 48 (b) 30
(c) 45 (d) 40

6. In the given figure, ABCD is a square. A line segment DX cuts the side BC at X and the diagonal AC at O such that $\angle COD = 105^\circ$, $\angle OCX = 45^\circ$ and $\angle OXC = x$. The value of x is



(a) 85° (b) 80°
(c) 40° (d) 60°

7. In a quadrilateral ABCD, if AO and BO be the bisectors of $\angle A$ and $\angle B$ respectively, $\angle C = 70^\circ$ and $\angle D = 130^\circ$ then $\angle AOB$ is

(a) 50° (b) 80°
(c) 40° (d) 100°

8. When a die is thrown, what is the probability of getting an even number?

(a) $\frac{1}{4}$ (b) 1
(c) $\frac{1}{2}$ (d) 0

9. What is the probability of choosing a vowel from the alphabets?

(a) $\frac{1}{26}$ (b) $\frac{10}{26}$
(c) $\frac{5}{26}$ (d) $\frac{21}{26}$

10. A bag contains 3 white and 2 red balls. One ball is drawn at random. What is the probability that the ball drawn is red?

(a) $\frac{2}{3}$ (b) $\frac{1}{2}$
(c) $\frac{1}{5}$ (d) $\frac{2}{5}$

11. Square root of

$$\frac{0.081}{0.0064} \times \frac{0.484}{6.25} \times \frac{2.5}{12.1} \text{ is } \underline{\hspace{2cm}}.$$

(a) 0.45 (b) 0.75
(c) 0.99 (d) 0.95

12. Without doing any calculation, find the numbers which are surely perfect squares.

A. 2025 B. 2577
C. 2568 D. 2543
(a) C (b) B
(c) A (d) D

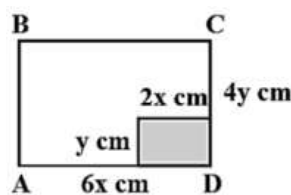
13. The value of $\sqrt{10 + \sqrt{25 + \sqrt{108 + \sqrt{154 + \sqrt{225}}}}}$ is

(a) 4 (b) 8
(c) 6 (d) 10

Space for Rough Work

14. The smallest number by which 3087 may be multiplied so that the product is a perfect cube, is
- (a) 5 (b) 4
(c) 3 (d) 6
15. If the volume of a cubical box is 35.937 m^3 , what is the length of its one side?
- (a) 6.3 m (b) 6.6 m
(c) 3.6 m (d) 3.3 m
16. If Shilpa had Rs 600 left after spending 75% of her money, how much did she have in the beginning?
- (a) Rs 2,700 (b) Rs 2,500
(c) Rs 2,000 (d) Rs 2,400
17. The population of a city first increased by 10% and then decreased by 20%. The net decrease in the population is
- (a) 20% (b) 15%
(c) 12% (d) 8%
18. A shop gives 20% discount. What would the sale price of a bag marked at Rs 250?
- (a) Rs 10 (b) Rs 40
(c) Rs 20 (d) Rs 200
19. The sum of two binomials is $5x^2 - 6x$. If one of the binomial is $3x^2 - 2x$. What is the other binomial?
- (a) $2x^2 - 8x$ (b) $8x^2 - 8x$
(c) $2x^2 - 4x$ (d) $8x^2 - 4x$

20. The figure shows a rectangle ABCD



Calculate the unshaded area.

- (a) $12xy$ (b) $4x + 3y$
(c) $22xy$ (d) $8x + 5y$
21. A rectangular room is 10 m wide and 6 m high. If the area of its four walls is 540 m^2 , then its length will be:
- (a) 35 m (b) 70 m
(c) 45 m (d) 40 m
22. 160 m^3 of water is to be used to irrigate a rectangular field whose area is 800 m^2 . What will be the height of the water level in the field?
- (a) 0.2 m (b) 1.6 m
(c) 2 m (d) 0.4 m
23. Find out the length of the longest rod which can be kept in the hall of 10 m length, 6 m breadth and 4 m height?
- (a) $4\sqrt{38} \text{ m}$ (b) 19 m
(c) $2\sqrt{19} \text{ m}$ (d) $2\sqrt{38} \text{ m}$

Space for Rough Work

24. $\left(\frac{x^{-3}}{y^3}\right)^{2/3} \times \left(\frac{x^3}{y^{-3}}\right)^{-2/3}$ is equal to

(a) $\frac{x^4}{y^{-4}}$ (b) $\frac{x^{-4}}{y^4}$

(c) $\frac{1}{x^2 y^2}$ (d) $\frac{y^4}{x^4}$

25. If $3^x = \frac{1}{9}$, the value of x is

(a) 2 (b) $\frac{1}{2}$

(c) 1 (d) -2

26. Which of the following is in direct proportion?

- (a) One side of a cuboid and its volume.
- (b) Change in weight and height among individuals.
- (c) Speed of a vehicle and the distance travelled in a fixed time interval.
- (d) Number of pipes to fill a tank and the time required to fill the same tank

27. If two quantities x and y vary directly with each other, then

- (a) $\frac{x}{y}$ remains constant
- (b) $x + y$ remains constant
- (c) $x \times y$ remains constant
- (d) $x - y$ remains constant y

28. If $\frac{1}{5} : \frac{1}{x} = \frac{1}{x} : \frac{1}{125}$, then the value of x is _____.

- (a) 1.25 (b) 2.25
- (c) 25 (d) 1.5

29. Factorise: $a^2 - 2ab + b^2 - c^2$

- (a) $(a - b - c)(a - b - c)$
- (b) $(a - b - c)(a + b + c)$
- (c) $(a + b + c)(a + b + c)$
- (d) $(a - b - c)(a - b + c)$

30. The factorisation of $3x^2 + 10x + 8$ is

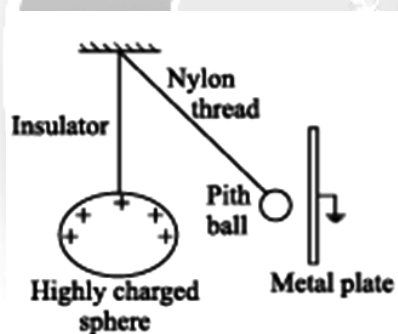
- (a) $(3x - 4)(x + 2)$ (b) $(3x + 4)(x + 2)$
- (c) $(3x + 4)(x - 2)$ (d) $(3x - 4)(x - 2)$

Space for Rough Work

PART - III : PHYSICS & CHEMISTRY

1. Which of the following statements are true?
 - I. When a batsman hits a cricket ball with his bat, the force applied by the batsman is muscular force.
 - II. In an electric bell, the hammer strikes the gong due to electrostatic force.
 - III. During dry weather, hair tend to attract the comb while combing, this is due to magnetic force of attraction.
 - IV. Walking on ice is difficult because of small frictional force.

(a) I and II only (b) I and IV only
 (c) II, III and IV only (d) I, II and IV only
2. A pith ball makes contact with and is then repelled by a highly charged sphere as shown in the diagram. Which of the following will happen when an earthed metal plate is brought close to, but not touching, the pith ball?



- (a) The ball will be repelled to the far side of the sphere.
- (b) The ball will be repelled so that it makes contact with sphere.
- (c) The ball will be attracted to the plate, make contact, and be neutralised.
- (d) The ball will be attracted to the plate, make contact, and then be repelled.

3. Suppose a new planet is discovered which revolves around the Sun (i.e., it is a part of our solar system). What is its time period if its orbit lies between Saturn and Uranus?
 - (a) Less than that of Uranus
 - (b) More than that of Uranus
 - (c) Equal to that of Uranus or Saturn
 - (d) Less than that of Saturn
4. Read the given statements and select the correct option.

Statement 1 : When a guitar string is plucked lightly then it produces a feeble sound.

Statement 2 : Loudness of sound does not depend on the amplitude of vibrations of a vibrating object.

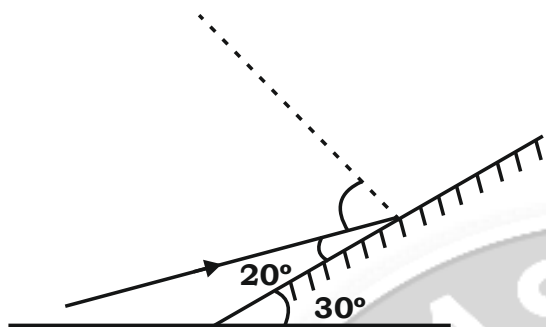
- (a) Both statements 1 and 2 are true and statement 2 is the correct explanation of statement 1.
 - (b) Both statements 1 and 2 are true but statement 2 is not the correct explanation of statement 1.
 - (c) Statement 1 is true but statement 2 is false.
 - (d) Both statements 1 and 2 are false
5. The sound produced by a tuning fork travel from air to glass. Which of the following physical quantities remains the same?

1. Velocity	2. Frequency
3. Wavelength	4. Amplitude

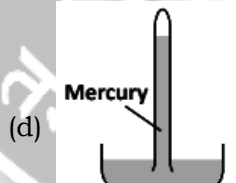
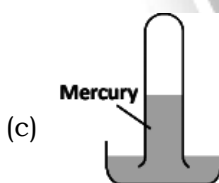
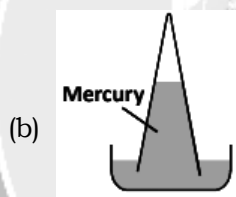
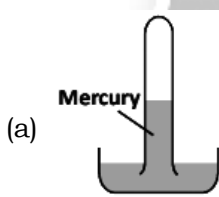
(a) Only 1 (b) Only 2
 (c) Both 1 and 3 (d) Both 2 and 4

Space for Rough Work

6. A plane mirror is inclined at 30° to the bench. A ray of light is directed so that it hits the mirror at an angle of 20° to the surface of the mirror. What is the angle of reflection?



- (a) 20° (b) 40°
(c) 65° (d) 70°
7. Which of the mercury barometers shown below indicate the highest air pressure?



8. The maximum force of friction when the body is just beginning to move is known as the
(a) limiting friction (b) rolling friction
(c) static friction (d) none of these
9. Rahul, who is visiting his relatives in the US, noticed that they use Fahrenheit to measure temperature. Today's temperature is 77° degrees Fahrenheit. Rahul wants to know the equivalent temperature in Celsius.
(a) 21°C (b) 25°C
(c) 31°C (d) 35°C
10. Read the given statements and select the correct option.

Statement 1 : Incident rays are parallel on a surface but the reflected rays are not parallel. This type of reflection is called regular reflection.

Statement 2 : Diffused reflection occurs due to failure of laws of reflection.

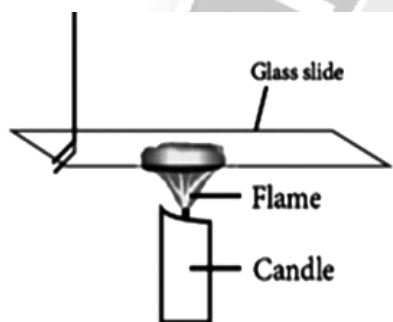
- (a) Both statements 1 and 2 are true and statement 2 is the correct explanation of statement 1.
(b) Both statements 1 and 2 are true but statement 2 is not the correct explanation of statement 1.
(c) Statement 1 is true but statement 2 is false.
(d) Both statements 1 and 2 are false

Space for Rough Work

11. In petroleum refineries, crude oil is separated into fractions like petrol, kerosene and diesel. This separation is possible because different hydrocarbons present in crude oil have:

- (a) Different colours and smells, so they can be separated layer by layer.
- (b) Different densities, so lighter ones float and heavier ones sink.
- (c) Different boiling points, so they condense at different heights in the fractionating column.
- (d) Different melting points, so they solidify at different temperatures.

12. Raman introduced a clean glass slide into the luminous zone of flame as shown in the figure and held it there for about 10 seconds. What will he observe after 10 seconds?



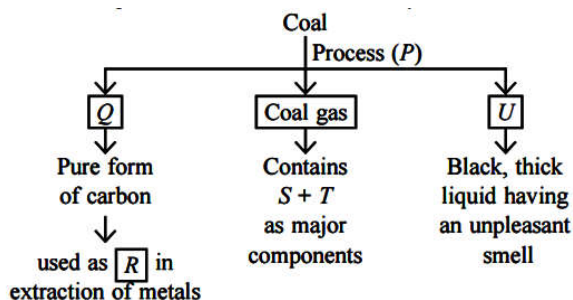
- (a) A circular blue ring is formed on the glass slide due to burning of carbon monoxide in luminous zone.
- (b) A circular blackish ring is formed on the glass slide due to deposition of unburnt carbon particles present in the flame.
- (c) A circular brownish ring is formed on the glass slide due to deposition of unburnt wax vapours.
- (d) Glass slide will remain clean as complete combustion takes place in this region.

13. Sujit took four different beakers I, II, III, and IV each containing 1 litre water. Also, he took four fuels W, X, Y, and Z. Then, he started heating the water in beakers I, II, III, and IV using 1 kg of each W, X, Y, and Z respectively. He found out that the heat produced by complete combustion of 2 kg of W, 4 kg of X, 1.2 kg of Y, and 3.2 kg of Z is 110000 kJ, 100000 kJ, 72000 kJ, and 12800 kJ respectively. Assume that all the heat released by burning the fuel is absorbed by water. In which beaker does the maximum evaporation take place?

- (a) I
- (b) II
- (c) III
- (d) IV

Space for Rough Work

14. During the electrolysis of water, hydroxide ions
- remain in solution
 - move towards anode
 - moved towards cathode
 - evaporated in air
15. Read the given flow chart carefully.



Which of the following statements is incorrect about P, Q, R, S, T and U?

- P is destructive distillation of coal and Q is coke.
- S and T are methane and nitrogen.
- U is coal tar and R is a reducing agent.
- The products obtained from U are used as starting materials to make dyes, drugs and paints, etc.

16. Rakshit has three test tubes containing ZnSO_4 , $\text{Al}_2(\text{SO}_4)_3$, and FeSO_4 solutions. He dropped magnesium pieces into all three test tubes:



Which of the following statements is/are correct?

- Reaction occurred in all the test tubes I, II, and III.
 - Colour change was observed in test tubes I and II.
 - Reaction occurred only in test tubes II and III.
 - Colour change was observed in test tube III only.
- (a) (i) and (iv) only (b) (i) and (ii) only
(c) (iii) and (iv) only (d) (iv) only

Space for Rough Work

17. Which one of the following is correct about nylon fibres?

- (a) Nylon fibres are very strong.
- (b) Nylon fibres absorb very little water.
- (c) Nylon fibres are fairly elastic.
- (d) All the above

18. Which one of the following statements is correct?

Statement 1 : Inflammable substances have low ignition temperature

Statement 2 : Coal is an inflammable substance

- (a) Statement 1
- (b) Statement 2
- (c) Both statements are correct
- (d) Both statements are incorrect

19. The colour of flame produced by the fuel in the sufficient supply of oxygen is:

- (a) Black
- (b) Yellow
- (c) Green
- (d) Blue

20. Assertion: Metals are sonorous.

Reason: They are generally brittle in the solid state, they break into pieces when hammered.

- (a) Both Assertion and Reason are correct and Reason is the correct explanation of Assertion.
- (b) Both Assertion and Reason are correct but Reason is not the correct explanation of Assertion.
- (c) Assertion is correct and Reason is incorrect.
- (d) Assertion is incorrect and Reason is correct

PART - IV : BIOLOGY

1. Which of the following is true about hybrid crops?

- (a) Always have low yield
- (b) More resistant to diseases
- (c) Do not require water
- (d) No need for fertilizers

2. Which disease is caused by a virus?

- (a) Tuberculosis
- (b) Malaria
- (c) Influenza
- (d) Ringworm

3. Which process helps to remove weeds and loosen soil before sowing?

- (a) Harvesting
- (b) Threshing
- (c) Ploughing
- (d) Sowing

4. In humans, the male gamete is called:

- (a) Ovum
- (b) Sperm
- (c) Spore
- (d) Pollen

5. Which of these methods is used to preserve harvested grains?

- (a) Adding neem leaves
- (b) Leaving them damp
- (c) Storing under water
- (d) None of these

6. Which micro-organism is responsible for the fermentation of grapes into wine?

- (a) Lactic acid bacteria
- (b) Yeast
- (c) Penicillium
- (d) Algae

Space for Rough Work

7. Which of the following is an example of external fertilization?
- (a) Birds (b) Fish
(c) Mammals (d) Reptiles
8. Viviparous animals are those which:
- (a) Lay eggs
(b) Give birth to live young
(c) Produce spores
(d) Do regeneration
9. Allopolyploidy refers to:
- (a) Variation caused by mutation
(b) Polyploidy involving different species
(c) Polyploidy within the same species
(d) Haploid condition
10. Which of the following is not a method of asexual reproduction?
- (a) Fragmentation
(b) Budding
(c) Pollination
(d) Spore formation

Space for Rough Work