



Class – VIII

School Integrated Program

ENTRANCE TEST CUM SCHOLARSHIP TEST

[Time: 3 Hours]

[Max Marks: 300]

A. General:

1. *This booklet is a Question Paper containing 100 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 optical mark recognition sheet (OMR Sheet), is provided separately.*
4. *DO NOT TAMPER WITH THE OMR OR THE BOOKLET.*
5. *Please fill your roll number correctly in the OMR sheet (answer sheet).*
6. *Both Question Paper and OMR Answer Sheet will be submitted after completion of this examination.*

B. Question Paper Format and marking scheme:

1. *The Question Paper consists of five parts (Part I: MAT, Part II: Physics, Part III: Chemistry, Part IV: Biology, Part V: Mathematics).*
2. *Each Question carries +3 marks for correct answer and -1 mark for incorrect answer.*

MAT

Direction (Q.1-3): what will come in place of question mark in the following series?

1. 63,58,51,40,27, ?
 (a) 8 (b) 12 (c) 10 (d) 14
2. 3,4,8,17,33,58, ?
 (a) 76 (b) 94 (c) 84 (d) 98
3. 8,48,16,96,32, ?
 (a) 192 (b) 150 (c) 58 (d) 288

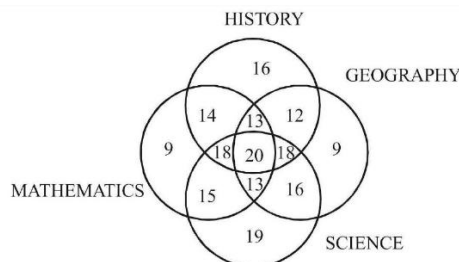
Direction (Q.4-5): In each of the following questions, four terms/words have been given, out of which three are alike in some manner and one is different. Choose the odd one out.

4. (a) Broad: Wide (b) Light: Heavy
 (c) Tiny : Small (d) Big : Large
5. (a) BDYW (b) CEXZ (c) DFYW (d) EGXV
6. If in a certain code, HAT is 782, RABBIT is 681192 . Then how will HABIT be coded as ?
 (a) 78139 (b) 78192 (c) 68192 (d) 78129
7. If REASON is coded as 5 , BELIEVED as 7 , what is the code number of GOVERNMENT?
 (a) 6 (b) 8 (c) 9 (d) 10

Direction (Q.8-9): Read the following information carefully to answer the questions.

- (i) 'A\$B' means 'A' is mother of 'B'
 - (ii) 'A # B' means 'A' is father of 'B'
 - (iii) 'A @ B' Means 'A' is husband of 'B'
 - (iv) 'A%B' means 'A' is daughter of 'B'
8. P@Q\$M# T indicates what relationship of P with T
 (a) Paternal grandmother (b) Maternal grandmother
 (c) Paternal grandfather (d) Maternal grandfather
 9. Which of the following expressions indicates 'R is the sister of H' ?
 (a) H \$ D @ F # R (b) R%D@ F\$H
 (c) R\$D@F#H (d) H%D@F\$R
 10. Deepak said to Nitin, " That boy playing football is the younger of the two brothers of the daughter of my father's wife "How is the boy playing football related to Deepak ?
 (a) Son (b) Brother (c) Cousin (d) Niece
 11. If $\times$ means $-$, $+$ means $\div$, $-$ means $\times$ and $\div$ means $+$ then $15 - 2 \div 900 + 90 \times 100 = ?$
 (a) 190 (b) 180 (c) 90 (d) -60
 12. One morning after sunrise, Gopal was facing a pole. The shadow of the pole fell exactly to his right. Which direction was he facing?
 (a) South (b) East
 (c) West (d) Data inadequate

Direction (Q.13-14): Refer to the following Venn diagram

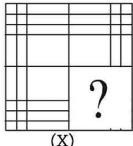
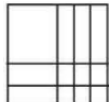
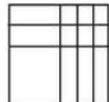
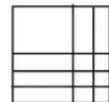
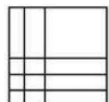
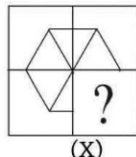
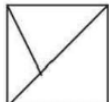
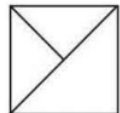
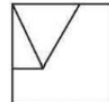
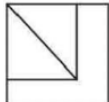


13. The number of students who took any three of the above subjects was
 (a) 62 (b) 63 (c) 64 (d) 66
14. Which subject was taken by the largest number of students?
 (a) Mathematics (b) Science (c) Geography (d) History
15. Choose the correct alternative that represents the relationship among illiterates, poor people and unemployed.

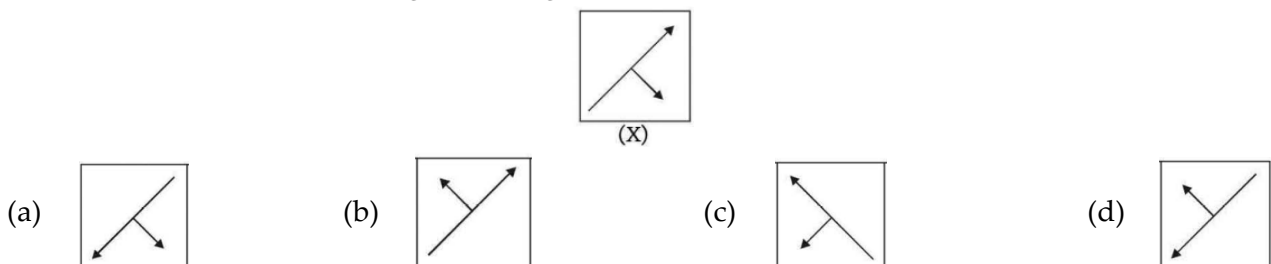


16. Monday falls on 4th April, 1998. What was the day on 3rd November, 1987 ?
 (a) Monday (b) Sunday
 (c) Tuesday (d) Wednesday
17. When the time is 4.20 , the angle between the hands of the clock is –
 (a) 20° (b) 15° (c) $12\frac{1}{2}^\circ$ (d) 10°

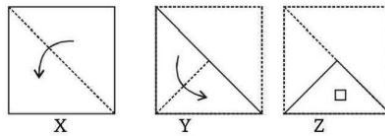
Direction (Q.18-19): In each of the following questions, select a figure from the four alternatives, which when placed in the space where the question mark is shown in figure (X) would complete the figure.

18.  (X)
- (a)  (b)  (c)  (d) 
19.  (X)
- (a)  (b)  (c)  (d) 
20. Find the correct option for the water image for the following question.
- $\overline{\text{g L a d}}$
?
- (a) $\overline{\text{a 7 e q}}$ (b) $\overline{\text{a 7 s q}}$ (c) $\overline{\text{a 7 s q}}$ (d) $\overline{\text{a 7 s p}}$

21. In the following question, choose the correct mirror-image of the Fig. (X) from amongst the four alternatives (a), (b), (c) and (d) given along with it.

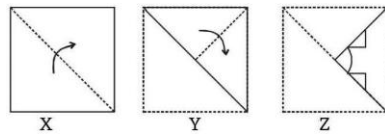


22. Consider the three figures, marked X, Y, and Z showing one fold in X , another in Y and the cut in Z. From amongst the four alternative figures (a), (b), (c) and (d) select the one showing the unfolded position of Z.



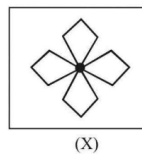
- (a) (b) (c) (d)

23. Consider the three figures, marked X, Y, and Z showing one fold in X , another in Y and the cut in Z. From amongst the four alternative figures (a), (b), (c) and (d), select the one showing the unfolded position of Z.



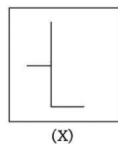
- (a) (b) (c) (d)

24. Find amongst the four alternatives (a), (b), (c) and (d), the figure which most nearly contains the figure (X).



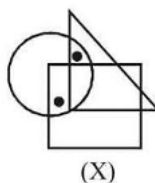
- (a) (b) (c) (d)

25. Find amongst the four alternatives (a), (b), (c) and (d), the figure which most nearly contains the figure (X).



- (a) (b) (c) (d)

26. In the following question, there is a diagram marked (X), with one or more dots placed in it. The diagram is followed by four other figures, marked (a), (b), (c) and (d) only one of which is such as to make possible the placement of the alternative in each these.



- (a) (b) (c) (d)

27. In the following question, two statements are given followed by four conclusions numbered I, II, III & IV. You have to take the given statements to be true even if they seem to be at variance from the commonly known facts & then decide which of the following conclusions logically follows from the given statements disregarding commonly known facts.

Statements: Some bottles are drinks. All drinks are cups.

Conclusions:

- | | |
|-----------------------------|--------------------------|
| I. Some bottles are cups | II. Some cups are drinks |
| III. All drinks are bottles | IV. All cups are drinks. |
| (a) Only I & II follow | (b) Only II & III follow |
| (c) Only II & IV follow | (d) Only III & IV follow |

Direction (Q.28-30): A number arrangement machine, when given a particular input, rearranges it following a particular rule. The following is the illustration of the input and the steps of arrangement:

Input, 27, 213, 309, 43, 89, 159, 275

Step I, 27, 213, 309, 159, 43, 89, 275

Step II, 27, 213, 89, 159, 309, 43, 275

Step III, 27, 309, 89, 159, 213, 43, 275

Step IV, 27, 43, 89, 159, 213, 309, 275

Step V, 27, 43, 89, 159, 213, 275, 309

This is the final arrangement and Step V is the last step for this input.

28. How many steps will be required to get the final output from the following input?

Input: 39, 149, 407, 79, 315, 217, 195

- (a) 5 (b) 6 (c) 7 (d) 8

29. What will be the fourth step for the following input?

Input: 312, 49, 215, 413, 187, 297, 132

- | | |
|--------------------------------|--------------------------------|
| (a) 312,49,187,215,297,413,132 | (b) 312,132,187,215,297,49,413 |
| (c) 312,49,187,215,413,297,132 | (d) 49,132,187,215,297,312,413 |

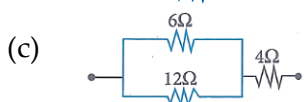
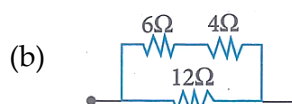
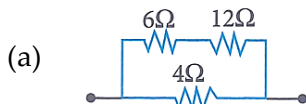
30. If following is the second step for an input, what will be the fifth step?

Step II: 439, 167, 297, 317, 517, 487, 132

- | | |
|---------------------------------|---------------------------------|
| (a) 167,517,297,317,439,487,132 | (b) 517,167,297,317,439,487,132 |
| (c) 132,167,297,317,439,487,517 | (d) Can't be determined |

PHYSICS

31. You are provided three resistances 4Ω , 6Ω , and 12Ω . How will you connect them so as to obtain the equivalent resistance of 8Ω ?



(d) None of these

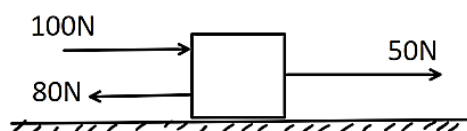
32. Three forces which are generally acting on an inflated balloon moving in upward direction in earth atmosphere

- | | |
|--|-------------------------------------|
| (a) Gravity, Electrostatic force, Magnetic force | (b) Gravity, Air friction, Buoyancy |
| (c) Gravity, Buoyancy, Magnetic force | (d) None of these |

33. The material of heating element in an electric press has

- | |
|---|
| (a) High melting point and high specific resistance |
| (b) High melting point and low specific resistance |

- (c) Low melting point and high specific resistance
 (d) Low melting point and high specific resistance
34. A neutral body gets charged when it is brought into contact with a charged body. This method of charging a body is called
 (a) Charging by conduction (b) Charging by friction
 (c) Charging by induction (d) None of the above
35. A 3 N horizontal force and 4 N horizontal force is acting on an object, but their directions are not given. What is the possible range for the magnitude F of the net force acting on the object?
 (a) $3\text{ N} \leq F \leq 2\text{ N}$ (b) $0.5\text{ N} \leq F \leq 4\text{ N}$
 (c) $4\text{ N} \leq F \leq 2\text{ N}$ (d) $1\text{ N} \leq F \leq 7\text{ N}$
36. In an electrical circuit, a fuse wire should be placed in the path of ___ wire.
 (a) Neutral (b) Phase (live)
 (c) Earth (ground) (d) None of these
37. Which electric lighting device offer both: longevity and the lowest electricity consumption?
 (a) Incandescent bulb (b) CFL
 (c) LED (d) Tube light
38. If the following forces are acting on the particle in a same plane as shown in figure. find out the net force acting on the particle.



- (a) 50 N towards right (b) 70 N towards right
 (c) 130 N towards left (d) 70 N towards left
39. Which of the statement is wrong?
 (a) like charges repel each other
 (b) unlike charges attract each other
 (c) Charged body can attract on uncharged body
 (d) Charged body can repel on uncharged body
40. Which of these circuits provides the most brightness from the bulb(s)?
 (a) A simple circuit with one bulb and one cell
 (b) A simple circuit with one bulb and two cell
 (c) A simple circuit with two bulb and one cell
 (d) A simple circuit with two bulb and no cell
41. Rahul has studied the following physical quantities in his VIIIth class. His teacher asked him to separate the vector quantities out the following quantities given below. Choose the correct answer. Momentum, Velocity, distance, displacement, speed, temperature, acceleration.
 (a) Momentum, Velocity, distance, acceleration
 (b) Momentum, Velocity, displacement, acceleration
 (c) Velocity, displacement, temperature, acceleration
 (d) Displacement, speed, temperature, acceleration
42. A and B are two objects with mass 60 kg and 90 kg respectively. Then
 (a) A has more inertia than B (b) B has more inertia than A
 (c) A and B both have same inertia (d) None of these
43. What materials are used to make an electromagnet? A coil of ___ copper wire is wrapped around a core of ____ .
 (a) Insulated, soft iron (b) Aluminium, insulated
 (c) Soft iron, uncovered (d) Magnet, uncovered
44. If a car is moving with the speed of 20 m/s covered 144 km and then with 10 m/s covered 72 km. find out the average speed of the car.
 (a) 72 km/hr (b) 81 km/hr
 (c) 54 km/hr (d) none of these

45. The force exerted by our muscles is called _____ and it is also called _____ force.
- (a) Muscular, noncontact (b) Muscular, contact
(c) Gravitational, contact (d) None of these

CHEMISTRY

46. Assertion (A): We depend on the heating effect of electric current to keep us warm.
Reason (R): Electric heaters utilize magnetic effects to generate thermal energy.
- (a) Both A and R are true, R explains A.
(b) Both A and R are true, R does not explain A.
(c) A is true, R is false.
(d) A is false, R is true.
47. What explains why a car stops when brakes are applied?
- (a) Magnetic force (b) Gravitational force
(c) Frictional force opposing motion (d) Decrease in atmospheric pressure
48. A gentle breeze turns into a strong cyclone primarily due to:
- (a) Decrease in local gravity (b) Strong pressure differences in the air
(c) Magnetic effects of the earth (d) Changes in the moon's phases
49. When classifying materials, how are compounds defined?
- (a) Pure substances containing a single type of particle
(b) Combinations separated physically
(c) Two or more elements bonded together
(d) Gas particles moving freely
50. Which phenomenon is responsible for the formation of an image in a shiny metal spoon?
- (a) Dispersion of light (b) Bending of light through lenses
(c) Reflection of light from curved surfaces (d) Absorption of light
51. Which of the following forces acts strictly as an attractive force at macroscopic distances, keeping planets in orbit?
- (a) Electrostatic force (b) Magnetic force
(c) Gravitational force (d) Frictional force
52. What happens to the constituent particles of sugar when it dissolves in water?
- (a) They are destroyed completely.
(b) They combine with water particles to form a new element.
(c) They separate and occupy the interparticle spaces between water particles.
(d) They float on the surface due to strong intermolecular forces.
53. What defines the melting point of a solid?
- (a) The maximum temperature at which it remains a solid.
(b) The temperature at which interparticle attractions become infinitely strong.
(c) The minimum temperature at which a solid melts to become a liquid at atmospheric pressure.
(d) The temperature at which it vaporizes instantly.
54. The melting point of Urea is:
- (a) 0°C (b) 100°C (c) 133°C (d) 1538°C
55. When transferring 200 mL of water from a wide jug to a narrow glass, what remains constant?
- (a) The shape of the water. (b) The volume of the water.
(c) The height of the water level. (d) None of these
56. If the interparticle space in a substance increases drastically while interparticle forces drop to negligible levels, the phase transition occurring is:
- (a) Freezing (b) Condensation
(c) Boiling (d) Deposition
57. If a student attempts to dissolve sand in boiling water, what will happen at the particle level?
- (a) The thermal energy will easily overcome the sand's interparticle forces, dissolving it.
(b) The water particles will break the sand particles into individual atoms.

- (c) The interparticle forces within sand remain too strong for water's kinetic energy to overcome, so it remains undissolved.
- (d) The sand will sublime
- 58. Which of the following pairs contains the most malleable metals?
 - (a) Iron and Copper
 - (b) Sodium and Potassium
 - (c) Gold and Silver
 - (d) Aluminium and Zinc
- 59. Suspension bridges and heavy cranes utilize ropes made of steel wires because:
 - (a) Steel is brittle.
 - (b) Steel wires can support heavy loads due to high tensile strength and ductility.
 - (c) Steel is a pure non-metal.
 - (d) Steel wires are highly sonorous.
- 60. For iron to develop a brown deposit (rust), which conditions are absolutely essential?
 - (a) Presence of dry air only
 - (b) Presence of water only
 - (c) Presence of both air (oxygen) and water (moisture)
 - (d) Presence of nitrogen and water

BIOLOGY

- 61. Four microorganisms are shown: Rhizobium, Lactobacillus, Penicillium, Yeast. Which one is different/odd one out from the other three in terms of its kingdom?
 - (a) Rhizobium - Bacteria, others are Fungi
 - (b) Penicillium - Fungus, Rhizobium is Bacteria, but Lactobacillus and Yeast are also Fungi
 - (c) Rhizobium and Lactobacillus are Bacteria, Penicillium and Yeast are Fungi, so 2-2
 - (d) None of above
- 62. A farmer says: "My crop is dying even though Rhizobium is present in its root nodules. But my neighbour's crop with Rhizobium is healthy." What is the most scientific reason?
 - (a) Rhizobium is harmful for his crop
 - (b) His crop is not a leguminous crop, so Rhizobium cannot fix nitrogen in non-legumes
 - (c) Rhizobium only works in presence of yeast
 - (d) Rhizobium needs sunlight to fix nitrogen
- 63. You have 3 methods:
 - P - Adding salt to raw mango
 - Q - Adding sugar to apple jam
 - R - Heating milk to 70°C for 15 sec and rapid cooling
 P and Q work on same principle but R is different. What is the principle?
 - (a) P, Q kill microbes by dehydration (plasmolysis), R kills microbes by heat
 - (b) All three kill microbes by heat
 - (c) P, Q preserve by adding chemicals, R by removing water
 - (d) All work by dehydration
- 64. Match the disease with its INCORRECT mode of transmission:
 - (a) Tuberculosis – Air
 - (b) Cholera - Contaminated water/food
 - (c) Malaria - Contaminated air
 - (d) Chickenpox - Air/direct contact
- 65. A baby is given BCG, Polio, Hepatitis B at birth. After 5 years he gets infected with the same pathogen of TB. Why does he NOT get severe disease?
 - (a) Because BCG contains antibodies that stay forever
 - (b) Because BCG contains weakened pathogen that creates memory cells, which give faster secondary response
 - (c) Because vaccine kills pathogen permanently in environment
 - (d) Because antibodies given in vaccine never decrease

66. Which of the following is NOT considered a microorganism in Class 8 syllabus but is often confused?
- Virus - because it is not a cell and only replicates inside host
 - Bacteria
 - Algae like Chlamydomonas (microscopic)
 - Protozoa
67. Assertion (A): Yeast is used in making bread but bacteria is used in making curd.
Reason (R): Yeast respire anaerobically to produce CO₂ which raises dough, while Lactobacillus converts lactose to lactic acid.
- Both A and R true and R is correct explanation
 - Both true but R not correct explanation
 - A true R false
 - A false R true
68. If you leave a moist bread slice in open for 3-4 days, you see black, green, white spots. What are they and why did they grow only on moist bread and not on dry toast kept beside it?
- Bacteria, they need moisture to grow
 - Fungi (Bread mould), they need moisture and nutrients; dry toast has no moisture for spore germination
 - Algae, they need water
 - Viruses, they need moisture
69. Correct order of nitrogen cycle events is:
- Nitrogen fixation by bacteria → Nitrification → Denitrification
 - Denitrification → Nitrification → Fixation
 - Nitrification → Fixation → Denitrification
 - Fixation → Denitrification → Nitrification
70. Why is there no vaccine for common cold but we have for polio and measles, even though all are viral?
- Common cold virus mutates very fast and has 200+ types, so one vaccine can't cover all
 - Common cold is bacterial
 - Polio virus is weaker
 - Scientists did not try for common cold
71. A doctor prescribed antibiotics for a patient suffering from common cold and the patient took 2 days and stopped as he felt better. After 2 weeks, cold returned more severely.
What is the mistake?
- Antibiotics don't work on viral common cold
 - Incomplete course leads to antibiotic resistance
- Only 1 is correct
 - Only 2 is correct
 - Both 1 and 2 are correct and related
 - Both wrong, antibiotics should be taken only 2 days
72. A person is infected with Salmonella typhi (Typhoid) but shows no symptoms, yet he is working as a cook in a hostel. What will happen?
- Nothing, as he has no symptoms he cannot spread
 - He is a carrier and can spread typhoid to many through food
 - He will only spread through air
 - Typhoid spreads only by mosquitoes
73. Pasteurization Data Based
Louis Pasteur heated milk to 62.8°C for 30 min. Modern method heats to 71.7°C for 15 sec. What is the common goal, and why modern method is preferred commercially?
- Both kill 100% microbes, modern is faster and preserves nutrients better
 - Both only kill harmful bacteria, modern is cheaper
 - Old kills all, new kills only few

- (d) Both make milk solid
74. Which pair is correctly matched?
- (a) Plasmodium - Malaria - Spread by female Anopheles - Protozoa
 (b) Entamoeba - Dysentery - Spread by Aedes mosquito
 (c) Trypanosoma - Sleeping sickness - Spread by contaminated water
 (d) Plasmodium - Bacteria
75. If health is the ultimate treasure, why does WHO define health as "physical, mental and social well-being" and not just "absence of disease"?
- (a) Because a person with no disease but always anxious and isolated is not truly healthy and more prone to infections
 (b) Just for definition sake
 (c) Mental health is not real health
 (d) Social well-being means only having money

MATHEMATICS

76. How many perfect squares lie strictly between 120 and 300?
 (a) 6 (b) 7 (c) 8 (d) 9
77. The sum of the first N odd natural numbers is 169. What is the value of $N^2 - N$?
 (a) 144 (b) 156 (c) 169 (d) 182
78. How many positive integers less than 1000 have an odd number of positive integer divisors?
 (a) 31 (b) 30 (c) 32 (d) 999
79. If t is the smallest integer such that $392 \times t$ is a perfect cube, what is the value of t^2 ?
 (a) 49 (b) 7 (c) 8 (d) 64
80. If a 4-digit number $3x4y$ is divisible by 36, what is the maximum possible value of $x + y$?
 (a) 13 (b) 14 (c) 11 (d) 12
81. When 4 consecutive integers are combined with alternating signs $(+, -, +)$ or $(-, +, -)$, the result is always:
 (a) An even number (b) An odd number (c) A multiple of 4 (d) Zero
82. If a number leaves a remainder of 3 when divided by 5, what is the remainder when its square is divided by 5?
 (a) 1 (b) 9 (c) 2 (d) 4
83. Simplify: $(x + 3)(x - 3) + 9$
 (a) x^2 (b) $x^2 + 18$ (c) $x^2 - 18$ (d) $x^2 - 9$
84. If $a^2 + b^2 = 25$ and $ab = 12$, find the value of $(a + b)^2$.
 (a) 49 (b) 1 (c) 37 (d) 24
85. If $(x - \frac{1}{x}) = 4$, what is the value of $x^2 + \frac{1}{x^2}$?
 (a) 18 (b) 16 (c) 14 (d) 20
86. If 15 pens cost Rs 120, how many pens can you buy for Rs 200?
 (a) 20 (b) 25 (c) 30 (d) 18
87. A recipe uses 3 cups of flour for every 2 cups of sugar. If 15 cups of flour are used, how much sugar is needed?
 (a) 10 cups (b) 5 cups (c) 12 cups (d) 8 cups
88. In a mixture of 60 liters, the ratio of milk to water is 2:1. How much water must be added to make the ratio 1:2?
 (a) 60 liters (b) 40 liters (c) 20 liters (d) 30 liters
89. If the hypotenuse of an isosceles right triangle is $\sqrt{50}$, what is the length of each leg?
 (a) 5 (b) 25 (c) 10 (d) $5\sqrt{2}$
90. If $(3k, 4k, 5k)$ is a Baudhāyana triple, what is the value of the hypotenuse if the perimeter is 60?
 (a) 25 (b) 20 (c) 15 (d) 30

91. In the Sulba-Sutra, combining two squares of areas 16 and 9 forms a new square. What is its perimeter?
(a) 20 (b) 25 (c) 12 (d) 16
92. 15 workers build a wall in 20 days. How many workers are needed to build it in 12 days?
(a) 25 (b) 20 (c) 30 (d) 18
93. In a map, RF is 1:2,500,000. A distance of 4 cm on the map is how many km in reality?
(a) 100 km (b) 250 km (c) 10 km (d) 1000 km
94. Pump A fills a tank in 3 hours. Pump B fills it in 6 hours. Together they fill it in:
(a) 2 hours (b) 1.5 hours (c) 4.5 hours (d) 9 hours
95. A TV costs Rs 20,000. If its price depreciates by 10% each year, what is its value after 2 years?
(a) Rs 16,200 (b) Rs 18,000 (c) Rs 16,000 (d) Rs 16,400
96. If the cost price of 15 articles equals the selling price of 12 articles, the profit percentage is:
(a) 25% (b) 20% (c) 30% (d) 15%
97. A trader marks his goods 40% above cost price and allows a discount of 25%. What is his profit percentage?
(a) 5% (b) 10% (c) 15% (d) 0%
98. The mean of the first 10 prime numbers is:
(a) 12.9 (b) 10.5 (c) 11.2 (d) 13.1
99. If a constant k is multiplied to every observation in a dataset, the new mean is:
(a) k times the old mean (b) The old mean $+k$
(c) Unchanged (d) k^2 times the old mean
100. A dataset has a median of 15. If two values, 10 and 20, are added to the dataset, the new median is:
(a) 15 (b) 15.5
(c) 14.5 (d) Cannot be determined