

1. The velocity-time graph for a body with non uniform motion is a -
 - (1) straight line
 - (2) straight line parallel to x-axis
 - (3) straight line parallel to y-axis
 - (4) curved line
2. Area under a velocity-time graph gives
 - (1) time taken by a moving object
 - (2) displacement travelled by a moving object
 - (3) acceleration of moving object
 - (4) retardation of a moving object
3. If the normal reaction R between the two surfaces in contact is doubled, what happens to the coefficient of friction?
 - (1) Doubled
 - (2) Halved
 - (3) Unchanged
 - (4) Depends on the nature of surfaces
4. The mass of an elevator is 4000 kg. The tension in the cable is 56 kN. Starting from the ground floor, how much distance will it rise in 2s?
 - (1) 2m
 - (2) 4m
 - (3) 8m
 - (4) 16m
5. Two boys are left in the middle of a frictionless floor. A boy of mass 20 kg gives a blow lasting for one millisecond of 100 kN to the other. He himself will move with a velocity of :
 - (1) 1 ms^{-1}
 - (2) 0.5 ms^{-1}
 - (3) 0.01 ms^{-1}
 - (4) 5 ms^{-1}
6. An electric heater is rated 1500 W. The energy used by it in 10 hours is :
 - (1) 5 kWh
 - (2) 10 kWh
 - (3) 15kWh
 - (4) 20kWh.
7. An object of mass m is moving with a constant velocity 'u'. The work done on the object to bring it to rest is :
 - (1) mv^2
 - (2) $\frac{1}{2} mv^2$
 - (3) mv
 - (4) $\frac{m^2v}{2}$
8. The radius of earth is about 6400 km. The mass of the earth is 10 times of mars. An object weights 20 N on Earth's surface, and then its weight on mars would be ?
 - (1) 4
 - (2) 6
 - (3) 2
 - (4) 8
9. The weights of an object a sea level in a coal mine and at the top of mountain are w_1 , w_2 and w_3 respectively. If the depth of mine is equal to the height of mountain. Find the relation between the value of weights.
 - (1) $w_1 > w_2 > w_3$
 - (2) $w_2 > w_3 > w_1$
 - (3) $w_3 > w_1 > w_2$
 - (4) $w_1 < w_2 < w_3$
10. If d and d_0 respresent density of material of body floating on surface of water and that of water respectively, then the fraction of volume of body inside the water is
 - (1) $\frac{d}{d_0}$
 - (2) $\frac{d_0}{d}$
 - (3) $\frac{d_0 - d}{d}$
 - (4) $\frac{d}{d_0 - d}$
11. The relative density of a solid is 0.6. It floats in water with
 - (1) whole of its volume inside water
 - (2) 60% volume inside water
 - (3) 60% volumne outside water
 - (4) 40% volume inside water
12. The sound waves in a medium are characterized by the :
 - (1) linear motion of particles in the medium
 - (2) rotatory motion of particle in the medium
 - (3) Oscillatory motion of particles in the medium
 - (4) none of the above
13. The sound wave which travel in the air are.
 - (1) transverse wave
 - (2) longitudinal waves
 - (3) polarized wave
 - (4) none of the above
14. The diffusibility of which physical state of matter is maximum?
 - (1) Solid
 - (2) Liquid
 - (3) Gas
 - (4) Diffusibilty is independent of physical state
15. When two pieces of ice are pressed together they form a single lump. This happens due to
 - (1) liquefication
 - (2) occlusion
 - (3) absorption
 - (4) regelation
16. At Darjeeling, distilled water boils at a temperature
 - (1) above 373K
 - (2) above 473K
 - (3) below 373K
 - (4) at 373K

17. Which among the following statements is true?
 - (1) The rate of evaporation in a coastal area is less because of high humidity.
 - (2) The rate of evaporation in a coastal area is more because of presence of water bodies.
 - (3) the rate of evaporation is independent of humidity.
 - (4) The rate of evaporation is directly proportional to humidity.
18. Pure copper sulphate can be obtained by
 - (1) Distillation
 - (2) Evaporation
 - (3) Crystallization
 - (4) Fractional crystallization
19. Which of the following substances when mixed with sand cannot be separated by sublimation ?
 - (1) NaCl
 - (2) NH_4Cl
 - (3) Camphor
 - (4) Iodine
20. Which of the following is a physical change ?
 - (1) Evaporation of alcohol
 - (2) Melting of ice
 - (3) Rusting of iron
 - (4) Both (1) & (2)
21. The molecular formula of Sucrose is -
 - (1) CH_2O
 - (2) $\text{C}_6\text{H}_{12}\text{O}_6$
 - (3) $\text{C}_{12}\text{H}_{22}\text{O}_{11}$
 - (4) CH_3COOH
22. What is the chemical name of quick lime?
 - (1) Calcium Oxide
 - (2) Calcium Carbonate
 - (3) Calcium hydroxide
 - (4) Carbon dioxide
23. To prepare 100 ml, 2M, NaOH solution, _____gram of NaOH will be required?
 - (1) 40 g
 - (2) 8g
 - (3) 16 g
 - (4) 24 g
24. In which of the following electrovalent compound both cation and anion represent the same inert gas configuration?
 - (1) Calcium bromide
 - (2) Magnesium chloride
 - (3) Strontium oxide
 - (4) Potassium sulphide
25. Which of the following acid molecule differ from other molecules regarding their total number of valence electrons?
 - (1) HClO_4
 - (2) H_3PO_4
 - (3) HNO_3
 - (4) H_2SO_4
26. How many orbitals can have the following set of quantum numbers
 $n = 3, l = 2, m = -2$
 - (1) 1
 - (2) 8
 - (3) 2
 - (4) 4
27. Major component of cell membrane is
 - (1) Lipid
 - (2) Protein
 - (3) Carbohydrate
 - (4) Nucleic acid
28. What is the latest model of plasmalemma?
 - (1) Unit membrane model
 - (2) Fluid mosaic model
 - (3) Lac operon model
 - (4) Sandwich model
29. Study of cell known as
 - (1) Mycology
 - (2) Protology
 - (3) Cytology
 - (4) Microbiology
30. Meristems are
 - (1) Mature cells
 - (2) Well differentiated cells
 - (3) Embryonal cells
 - (4) None
31. Macrophage is an enlarged :
 - (1) WBC
 - (2) Blood cells
 - (3) Nerve cell
 - (4) Both (1)&(2)
32. The mode of nutrition in Ascaris is :
 - (1) Holozoic
 - (2) Holophytic
 - (3) Saprozoic
 - (4) Saprophytic
33. Devil fish is the common name of :
 - (1) Sepia
 - (2) Loligo
 - (3) Octopus
 - (4) Tereido
34. Many children in our country suffer from Kwashiorkor. This can be prevented by giving children food rich in
 - (1) carbohydrates
 - (2) fats
 - (3) proteins
 - (4) minerals
35. A chronic disease is
 - (1) hypertension
 - (2) typhoid
 - (3) diarrhoea
 - (4) kala-azar
36. If the plants of world die, all the animals will also, die due to the & shortage of
 - (1) Cold
 - (2) Water
 - (3) Oxygen
 - (4) Timber
37. What are the chief pollutants of the atmosphere which are most likely to deplete the ozone layer ?
 - (1) Sulphur dioxide
 - (2) Carbon dioxide
 - (3) Carbon monoxide
 - (4) Nitrogen oxides and chlorofluorocarbons

38. Which of the following is incorrect for green manure?
 (1) it supplies organic matter
 (2) it supplies nitrogen
 (3) it prevents soil erosion
 (4) it allows leaching
39. Increase in oil production
 (1) golden revolution
 (2) yellow revolution
 (3) white revolution
 (4) blue revolution
40. What makes the bread soft and fluffy?
 (1) Finely ground flour
 (2) Alcohol given off during fermentation of sugar
 (3) Carbon dioxide gas given off during fermentation of sugar
 (4) Oxygen gas
41. Rational number $-\frac{13}{3}$ lies between consecutive integers
 (1) -2 and -3 (2) -3 and -4
 (3) -4 and -5 (4) -5 and -6
42. Set of natural numbers is a subset of
 (1) set of even numbers
 (2) set of odd numbers
 (3) set of composite numbers
 (4) set of real numbers
43. A rational number between $\frac{1}{7}$ and $\frac{2}{7}$ is
 (1) $\frac{1}{14}$ (2) $\frac{2}{21}$
 (3) $\frac{5}{14}$ (4) $\frac{5}{21}$
44. The square root of $X^{m^2-n^2} \cdot X^{n^2-2mn} \cdot X^{n^2}$ is
 (1) X^{m+n} (2) $X^{(m-n)}$
 (3) $X^{\frac{(m+n)}{2}}$ (4) $X^{\frac{1}{2}(m-4)^2}$
45. The HCF of the polynomials $(2x-1)(5x^2-ax+3)$ and $(x-3)(2x^2+x+b)$ is $(2x-1)(x-3)$. Then the values of a and b respectively are _____
 (1) 16, -1 (2) -16, 1 (3) -16, -1 (4) 16, 1
46. The HCF of the polynomials x^3-3x^2+7x-5 and x^2+5-2x is
 (1) x^2-2x-5 (2) x^2-2x+5
 (3) $x-1$ (4) $3x+2$
47. The points $(-5,12)$ (9, 10) and (6, 5) taken in order form $(-2, -3)$
 (1) a square (2) a parallelogram
 (3) a trapezium (4) a straight line
48. The mid points of the sides of a triangle are $(-1, 3)$, $(-2, 4)$ and $(2, -5)$. The vertex of the triangle opposite to $(-1, 3)$ is
 (1) $(3, -6)$ (2) $(-5, 12)$
 (3) $(1, -4)$ (4) None
49. The point of intersection of X and Y axes is called :
 (1) origin (2) null point
 (3) common point (4) None
50. Suresh travelled 1200 km by air which formed $(\frac{2}{5})$ of his trip. One third of the whole trip, he travelled by car and the rest of the journey he performed by train. Find the distance travelled by train. Also, find the speed of the train if the time taken for the train to travel the whole distance is 8 hrs.
 (1) 1600 km, 350 km/hr (2) 800 km, 375 km/hr
 (3) 1800 km, 300 km/hr (4) 480 km, 380 km/hr
51. Given : $3x-4y=7$ and $x+cy=13$, for what value of 'c', the two equations not have a solution?
 (1) $\frac{3}{4}$ (2) $\frac{4}{3}$
 (3) -4 (4) $-\frac{4}{3}$
52. How many straight lines can pass through two distinct points?
 (1) 1 (2) 2
 (3) 3 (4) 4
53. A proof is required for :
 (1) Postulate (2) Axiom
 (3) Theorem (4) Definition
54. Two planes intersect each other to form a/an :
 (1) Plane
 (2) Point
 (3) Straight Line
 (4) Angle

55. If two interior angles on the same side of a transversal intersecting two parallel lines are in the ratio 2 : 3, then the measure of the larger angle is

- (1) 54° (2) 120°
(3) 108° (4) 136°

56. If a bicycle wheel has 48 spokes the angle between the adjacent pair spokes is :

- (1) $\left(6\frac{1}{2}\right)^\circ$ (2) $\left(7\frac{1}{2}\right)^\circ$
(3) $\left(7\frac{1}{3}\right)^\circ$ (4) $\left(6\frac{2}{3}\right)^\circ$

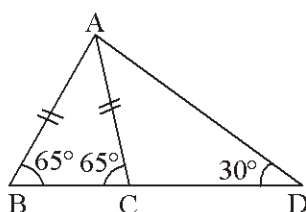
57. Two angles whose measures are a and b are such that $2a - 3b = 60^\circ$. Find $\frac{4a}{5b}$, if they form a linear pair:

- (1) 0 (2) $\frac{8}{5}$ (3) $\frac{1}{2}$ (4) $\frac{2}{3}$

58. If X is a point on the line AB and Y, Z are points outside such that $\angle AXZ = 45^\circ$ and $\angle YXZ = 60^\circ$, then $\angle BXZ$ is equal to

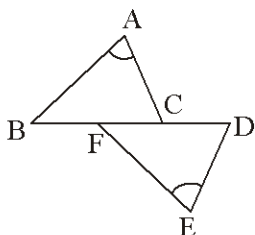
- (1) 120° (2) 75°
(3) 150° (4) 105°

59. In the figure given below



- (1) $BC < CA < CD$ (2) $BC > CA > CD$
(3) $BC = CA > CD$ (4) $BC > CA = CD$

60. In the figure, $BA \perp AC$ and $DE \perp EF$ such that $BA = DE$ and $BF = DC$. Then triangle $\triangle ABC$ is congruent to $\triangle EDF$ by



- (1) SSS (2) RHS (3) ASA (4) AAS

61. ABCD is a trapezium in which $AB \parallel DC$, $AD \perp AB$ and E & F are points on AD & BC respectively. BD is joined. If $\angle EFC = 110^\circ$, $\angle ABD = 60^\circ$, $\angle BDC = x^\circ$ and $\angle DCF = y^\circ$, then values of x and y are :

- (1) $60^\circ, 70^\circ$
(2) $50^\circ, 80^\circ$
(3) $90^\circ, 40^\circ$
(4) $30^\circ, 100^\circ$

62. Which of the following statements is incorrect ?

- (1) All rhombuses are parallelograms
(2) All squares are parallelograms
(3) All rectangles are square
(4) All squares are trapezium

63. Smallest angle of a triangle is equal to two third the smallest angle of a quadrilateral. The ratio of the angles of the quadrilateral is 3 : 4 : 5 : 6. Largest angle of the triangle is twice its smallest angle. What is the sum of second largest angle of the triangle and the largest angle of the quadrilateral ?

- (1) 160°
(2) 180°
(3) 190°
(4) 170°

64. The lengths of two adjacent sides of a parallelogram are 5 cm and 3.5 cm. One of its diagonals is 6.5 cm long. Area of the parallelogram is :

- (1) $13\sqrt{10} \text{ cm}^2$ (2) $23\sqrt{5} \text{ cm}^2$
(3) $10\sqrt{5} \text{ cm}^2$ (4) $10\sqrt{3} \text{ cm}^2$

65. Area of a trapezium whose parallel sides are 55 cm, 40 cm and non-parallel sides are 20 cm and 25 cm respectively is

- (1) 590 cm^2
(2) 950 cm^2
(3) 595 cm^2
(4) 940 cm^2

66. X and Y are respectively two points on the sides DC and AD of the parallelogram ABCD. The area of $\triangle ABX$ is equal to :

- (1) $\frac{1}{3} \times \text{area of } \triangle BYC$
(2) area of $\triangle BYC$
(3) $\frac{1}{2} \times \text{area of } \triangle BYC$
(4) $2 \times \text{area of } \triangle BYC$

67. A triangle ABC is inscribed in a circle, and the bisectors of the angles meet the circumference at X, Y, Z. The angles of the triangle X, Y, Z are respectively
- (1) $90^\circ - \frac{A}{2}, 90^\circ - \frac{B}{2}, 90^\circ - \frac{C}{2}$
 (2) $90^\circ, 60^\circ, 30^\circ$
 (3) $\frac{A}{2}, \frac{B}{2}, \frac{C}{2}$
 (4) $\frac{B}{2}, \frac{A}{2}, \frac{A}{2} - \frac{B}{2}$
68. The chord of the larger of two concentric circles is tangent to the smaller circle and has length 'a'. The area enclosed between the concentric circles is
- (1) πa^2
 (2) $\frac{\pi a^2}{2}$
 (3) $\frac{\pi a^2}{4}$
 (4) Cannot be determined for given data
69. PQ, PR are tangents to a circle and QS is a diameter. Then
- (1) $\angle QPR = \frac{1}{2} \angle RQS$ (2) $\angle QPR = 2 \angle RQS$
 (3) $\angle QPR = \angle RQS$ (4) None of the foregoing
70. Which of the following angles can be constructed by using ruler and compass only?
- (1) 20° (2) 72°
 (3) 105° (4) 130°
71. Which of the following angles can not be constructed by using ruler and compass only?
- (1) $22\frac{1}{2}^\circ$ (2) 45°
 (3) 70° (4) 90°
72. The area of a square is 225 m^2 . The perimeter of the square is 10 m less than the perimeter of the rectangle and breadth of the rectangle is 5 m. Find the area of the rectangle in m^2 .
- (1) 400 (2) 450
 (3) 150 (4) 322
73. The ratio of area of a square to another a square drawn on its diagonal is
- (1) $1 : \sqrt{2}$ (2) $1 : 2$
 (3) $2 : 1$ (4) $1 : 3$
74. Total surface area of a sphere S will radius $\sqrt{2} + \sqrt{3} \text{ cm}$ is
- (1) $400\pi(5 + 2\sqrt{6}) \text{ sqmm}$
 (2) $\pi(\sqrt{2} + \sqrt{3})^2 \text{ sqcm}$
 (3) $2\pi(\sqrt{2} + \sqrt{3})^2 \text{ sqcm}$
 (4) $40\pi(5 + 2\sqrt{6}) \text{ sqmm}$
75. A craft teacher reshapes the wax from a cylinder of candle with section diameter 6 cm and the height 6 cm into a sphere. The radius of this sphere will be
- (1) $r = 6\sqrt{3/2} \text{ cm}$ (2) $r = 6 \text{ cm}$
 (3) $r = 3\sqrt{3/2} \text{ cm}$ (4) $r = 6\sqrt{2} \text{ cm}$
76. If the mean of $2x, 2x + 3, 2x + 5, 2x + 7, 2x + 10$ is 11, the mean of the last three observations is
- (1) $10\frac{1}{3}$ (2) $10\frac{2}{3}$
 (3) $13\frac{1}{3}$ (4) $11\frac{2}{3}$
77. The median of a set of 9 distinct observations is 20.5. If each of the largest 4 observation of the set is increased by 2, then the median of the new set:
- (1) Is increased by 2
 (2) Is decreased by 2
 (3) Is two times the original median
 (4) Remains the same as that of the original set
78. A and B are two mutually exclusive events such that $P(1) = \frac{1}{2}$ and $P(2) = \frac{1}{3}$. Find $P(A \cup B)$.
- (1) $\frac{5}{6}$ (2) $\frac{3}{4}$
 (3) $\frac{2}{3}$ (4) None of these

79. What is the probability that the sum of two result is not 3 or 4 ?

- (1) $\frac{31}{36}$ (2) $\frac{4}{9}$
(3) $\frac{5}{36}$ (4) $\frac{1}{3}$

80. 3 identical dice are rolled. The probability that the same number will appear on each of them is :

- (1) $\frac{1}{6}$ (2) $\frac{6}{216}$
(3) $\frac{1}{216}$ (4) $\frac{3}{28}$

81. 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 ?

- (1) South
(2) North-West
(3) West
(4) South-West

82. Achild goes 50 metre towards South and then turning to his right, he goes 50 metre. Then, turning to his left, he goes 30 metre. Again he turns to his left and goes 50 metre. Howfar is he from his initial position ?

- (1) 30 metre (2) 40 metre
(3) 50 metre (4) 80 metre

83. Who is a better singer Dor F ?

Statements :

- I. F sings better than both Gand S.
II. Neither S nor F singer sowell as D.

- (1) Only I is sufficient.
(2) Only II is sufficient.
(3) Both I and II are required.
(4) Both I and II are not sufficient.

84. Who is the father of M?

Statements :

- I. P and Q are brothers.
II. Q's wife is the sister of M's wife

- (1) Statement I alone is sufficient to answer the problem
(2) Statement II alone is sufficient to answer the problem
(3) Statements I and II both both are needed.
(4) Statements I and II both are not sufficient

Directions : (85) Each of the following questions consists of information in three statements. Study the question and the statements and decidewhich of the statement/s is/are not required to answer the question and hence can be dispensed with.

85. What is the rate of interest per annum?

I. The amount becomes Rs. 11,025 with compound interest after 2 years

II. The same amount with simple interest becomes Rs. 11,000 after 2 years.

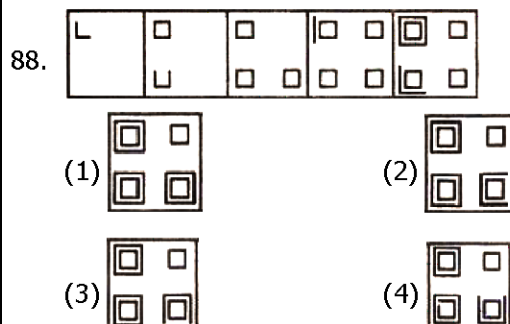
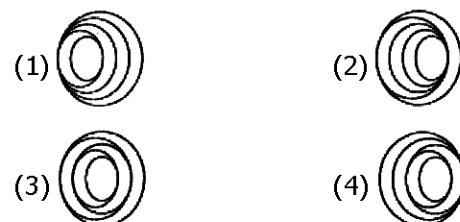
III. The amount invested is Rs. 10,000.

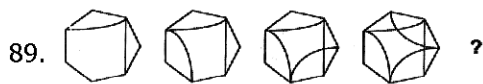
- (1) I or II only
(2) II or III only
(3) I or III only
(4) I or II and III only

86. In the following question, numbers given in three out of the four alternatives have same relationship. You have to choose the one which does not belong to the group

- (1) 5 : 9
(2) 7 : 11
(3) 13 : 17
(4) 19 : 23

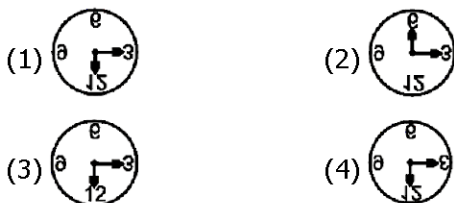
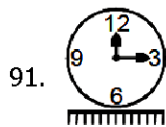
Directions : (87 to 89) There are two sets of figures namely the Problem figures containing five figures 1, 2, 3, 4, 5 and the Answer figures (1), (2), (3), (4). You have to select one figure from the Answer figures which will continue the same series as given in the Problem figures.





90. At what angle the hands of a clock are inclined at 50 minutes past 5.

- (1) 125°
(2) 130°
(3) 135°
(4) 140°



92. How many triangles are there in the following figure ?



- (1) 6
(2) 7
(3) 8
(4) 9

Directions : (93) In each of the following questions, you are given a combination of letters or group of numbers followed by four alternatives (1) (2) (3) and (4). Choose the alternative which most closely resembles the mirror image of the given combination.

Position of Mirror like This

93. 1 9 5 6 I N D O P A K

- (1) K A P O D N I 5 6 9 1
(2) P A K I N D O 1 9 5 6
(3) K A P O D N I 5 6 9 1
(4) K A P O D N I 5 6 9 1

Directions : (94-95) Find the missing terms

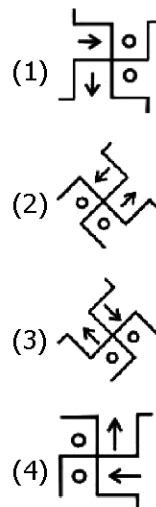
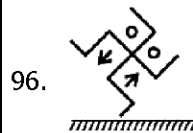
94. Z 15 A, W 13 C, ?, Q 9 G, N 7 I

- (1) T 12 E
(2) R 11 F
(3) R 13 D
(4) T 11 E

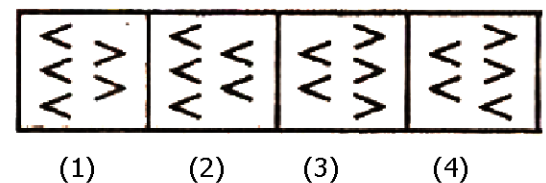
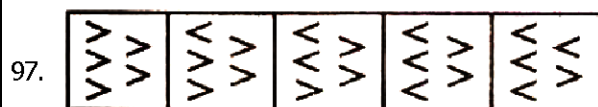
95. CFIJ, RUXY, EHKL, PSVW, ?

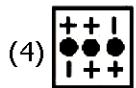
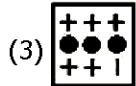
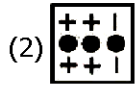
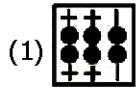
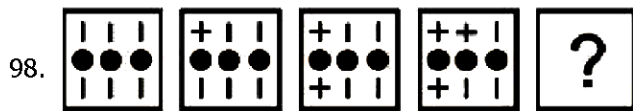
- (1) HILM
(2) YBEF
(3) UXZA
(4) MOSV

Directions : (96) In the following questions you have to visualize the image of the item (figure, word, letter, number) in water. The water source is below the item. Choose the water image from the alternatives.



Directions (97 to 98) : In each of the following, there are some figure which have some particular series. Find out the next figure ?

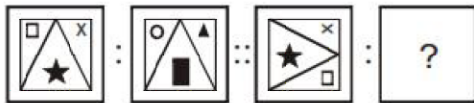




Directions : (99 to 100) There is some relationship between the two figures/pair of letters/numbers on the left of the sign (::).

The same relationship exists between the two terms on the right of which one is missing. Find the missing one from the given alternatives.

99. Problem figures



Answer figures

