Part II. Data Sufficiency

PRACTICE EXERCISE

Level - 1

Direction for questions 1 and 2: The questions are based on the situation given below.

Aditya purchases a brand new car. He asks his three friends, Virendar, Saurav and Sachin to tell its colour.

Virendar said, "I guess it is not red."

Saurav said, "It is either blue or white."

Sachin said, "It know, it is blue."

Aditya said, "At least one of you is right and at least one of you is wrong."

1. What is the colour of car?

(a) Red (b) Blue

(c) White (d) Either (a) or (b)

(e) Either (b) or (c)

2. Who was correct?

(a) Virendar

(b) Saurav

(c) Sachin

(d) Both (a) and (b)

(e) Both (b) and (c)

Direction for questions 3 to 5: Each question is followed by two statements, I and II. Answer each question using the following instructions:

Choose "a"if the question can be answered by using the statement I alone, but not by using statement II alone.

Choose "b"if the question can be answered by using statement II alone, but not by using statement I alone.

Choose "c"if the question can be answered by using either statement alone.

Choose "d"if the question can be answered by using both the statements together, but cannot be answered by using either statement alone.

Choose "e"If the question cannot be answered even by using both statements together.

3. How much money does Prem have at the least?

I. Prem has at least 100 rupees more than Jagdish.

II. The total money both Prem and Jagdish have is not more than 500 rupees.

4. What are the ages of three brothers ?

I. The product of their ages is 21.

II. The sum of their ages is not divisible by 3.

5. What is the rate of interest if a certain sum of money trebles itself in 10 years?

I. Principal is Rs. 2,000.

II. The sum of the money doubles itself in 5 years.

Direction for questions 6 to 9: Each question is followed by two statements, I and II. Answer each question using the following instructions:

Choose "a"if the question can be answered by using the statement I alone, but not by using statement II alone.

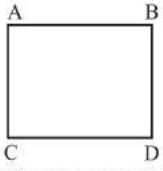
Choose "b"if the question can be answered by using statement II alone, but not by using statement I alone.

Choose "c"if the question can be answered by using either statement alone.

Choose "d"if the question can be answered by using both the statements together, but cannot be answered by using either statement alone.

Choose "e"If the question cannot be answered even by using both statements together.

6. Is quadrilateral ABCD a parallelogram?



I. AD and BC bisect each other.

II. AD = BC

7. Find the total profit or loss percentage.

I. Two articles are sold at the same selling price.

II. There is a gain of 25 per cent on the first article and a loss of 25 per cent on the second article.

8. There is a circle with centre C at the origin and radius r cm. Two tangents are drawn from an external point D at a distance d cm from the centre. What are the angles between each tangent and the X-axis.

I. The coordinates of D are given.

II. The X axis bisects one of the tangents.

9. ABC is an equilateral triangle. The lengths of its sides are changed. What is the value of the area of the new triangle?

I. The length of each side is increased by 25%.

II. The height of the new triangle is 10 cm.

Direction for questions 10 to 15: Each question is followed by two statements, I and II. Answer each question using the following instructions:

Choose "a"if the question can be answered by using the statement I alone, but not by using statement II alone.

Choose "b"if the question can be answered by using statement II alone, but not by using statement I alone.

Choose "c"if the question can be answered by using either statement alone.

Choose "d"if the question can be answered by using both the statements together, but cannot be answered by using either statement alone.

Choose "e"If the question cannot be answered even by using both statements together.

10. A circle circumscribes a square. What is the area of the square ?

I. The length of each of the two tangents of the circle from an external point 5 cm away from the centreof the circle is 4 cm.

II. The radius of the circle is 3 cm.

11. The average weight of students in a class is 50 kg. What is the number of students in the class?

I. The heaviest and the lightest members of the class weigh 60 kg and 40 kg respectively.

II. Exclusion of the heaviest and the lightest members from the class does not change the average weight of the students.

12. Is $x > y$?

I. The square of x is greater than the square of y.

II. $x/y = 9/7$.

13. P, Q, R and S are four consecutive even integers. What is the value of the largest integer among these?

I. The average of the four numbers is the first prime number greater than 10.

II. The ratio between the largest and smallest of the numbers is less than 10.

14. The distance from Merlin's office to his house is 45 miles. On Monday, Merlin went to office for a while but returned home early. What was the total travel time ?

I. He travelled at uniform rate, both going and coming, at 40 miles per hour.

II. If he went 50 miles per hour faster it would have taken lesser time.

15. What is $2 \oplus 3$?

I. $a \oplus b$ is not necessarily equal to $b \oplus a$ for two integers a and b, and $1 \oplus 2 = 3$

II. $a \oplus b = (a + b)/a$ for $a \neq 0$

Direction for questions 16 to 19: Each question is followed by two statements, I and II. Answer each question using the following instructions:

Choose "a"if the question can be answered by using the statement I alone, but not by using statement II alone.

Choose "b"if the question can be answered by using statement II alone, but not by using statement I alone.

Choose "c"if the question can be answered by using either statement alone.

Choose "d"if the question can be answered by using both the statements together, but cannot be answered by using either statement alone.

Choose "e"If the question cannot be answered even by using both statements together.

16. What are the values of a and b ?

I. The ratio of a and b is 3 : 5, and b is positive.

II. The ratio of 2a and b is 12 : 10, and a is positive.

17. Three professors A, B and C are separately given three sets of numbers to add. They were expected to find the answers to 1+1, 1+1+2, and 1+1 respectively. Their respective answers were 3, 3 and 2. How many of the professors are mathematicians ?

I. A mathematician can never add two numbers correctly, but can always add three numbers correctly.

II. When a mathematician makes a mistake in a sum, the error is + 1 or – 1.

18. A carpenter fixes 30 nails, equidistant from each other, along each side of a wooden board. How many nails are there in the wooden board?

I. The wooden board is a triangle measuring 29 inches on each side.

II. The wooden board is in the shape of a regular hexagon.

19. A cylinder of base area 10 sq. cm contains water up to a height of 10 cm. A smaller cylindrical block is dropped into this cylinder. By what height does the water rise in the cylinder?

I. The volume of the block is 100 cm^3.

II. The smaller cylinder is completely immersed when the water rises

Direction for questions 20 to 22: Each question is followed by two statements, I and II. Answer each question using the following instructions:

Choose "a"if the question can be answered by using the statement I alone, but not by using statement II alone.

Choose "b"if the question can be answered by using statement II alone, but not by using statement I alone.

Choose "c"if the question can be answered by using either statement alone.

Choose "d"if the question can be answered by using both the statements together, but cannot be answered by using either statement alone.

Choose "e"If the question cannot be answered even by using both statements together.

20. How many of A, B, C and D passed the exam ?

I. The following is a true statement: A and B passed the exam.

II. The following is a false statement: At least one among C and D has passed the exam.

21. What is the value of 'a' ?

I. $(x - a)$ is a factor of $x^3 - 9x^2 + 20x - 24$

II. $x^2 = 4$

22. What is price of tea ?

I. Price of Coffee is Rs. 5 more than the price of tea.

II. Price of Coffee is Rs. 5 less than that of a soft drink which is three times the price of tea.

Direction for questions 23 to 26: Each question is followed by two statements, I and II. Answer each question using the following instructions:

Choose "a"if the question can be answered by using the statement I alone, but not by using statement II alone.

Choose "b"if the question can be answered by using statement II alone, but not by using statement I alone.

Choose "c"if the question can be answered by using either statement alone.

Choose "d"if the question can be answered by using both the statements together, but cannot be answered by using either statement alone.

Choose "e"If the question cannot be answered even by using both statements together.

23. Find the sum of the cubes of two numbers.

I. The difference of the two numbers is 8.

II. The product of the two numbers is 20.

24. How many minutes does a clock gain in a day ?

I. When the actual time is 8 : 00 am, the clock shows 8 : 12 am.

II. The clock get 35 seconds faster each quarter of an hour.

25. What is the area of a regular hexagon ?

I. The length of the boundary line of the hexagon is 36 cm.

II. The area of the hexagon is 6 times the area of an equilateral triangle formed on one of the sides.

26. What are values of the real numbers X and Y ?

I. The arithmetic mean of X and Y is equal to 'a' and the geometric mean of X and Y is also equal to 'a'.

II. $(X/Y) = R$ and $(X - Y) = D$

Direction for questions 27 to 30: Each question is followed by two statements, I and II. Answer each question using the following instructions:

Choose "a"if the question can be answered by using the statement I alone, but not by using statement II alone.

Choose "b"if the question can be answered by using statement II alone, but not by using statement I alone.

Choose "c"if the question can be answered by using either statement alone.

Choose "d"if the question can be answered by using both the statements together, but cannot be answered by using either statement alone.

Choose "e"If the question cannot be answered even by using both statements together.

27. What percentage of the total students in the class passed?

I. 90% of the boys passed.

II. 10% of the girls failed.

28. Is p positive?

I. $pq = 7q$

II. q^2 is positive.

29. Is the triangle ABC an obtuse triangle?

I. $AB^2 > AC^2 + BC^2$

II. The square of one side is equal to the sum of the squares of the other two sides.

30. Is $p = r$?

I. $p = q + 7$

II. $r \leq q + 7$

Level - 2

Direction for questions 31 to 35: Each question is followed by two statements, I and II. Answer each question using the following instructions:

Choose "a"if the question can be answered by using the statement I alone, but not by using statement II alone.

Choose "b"if the question can be answered by using statement II alone, but not by using statement I alone.

Choose "c"if the question can be answered by using either statement alone.

Choose "d"if the question can be answered by using both the statements together, but cannot be answered by using either statement alone.

Choose "e"If the question cannot be answered even by using both statements together.

31. The total manufacturing cost (Cost Price) of an article is given by R + L + OH, where,

R = Raw material cost

L = Labour cost

OH = Overhead cost

What is the change in the profit percentage ? If,

I. The sales volume increases by 10 per cent

II. R increases by 1 per cent, L increases by I per cent and OH increases by 0%

32. Given that X and Y are non-negative, what is the value of X ?

I. $2X + 2Y \leq 40$

II. $X - 2Y \geq 20$

33. Is x > y?

I. –5x + 5y is negative.

II. 5x + 5y is positive.

34. A small storage tank is spherical in shape. What is the storage volume of the tank ?

I. The wall thickness of the tank is 1 cm.

II. When the empty spherical tank is immersed in a large tank filled with water, 20 litres of water overflows from the large tank.

35. What is the time now?

I. The hands of the clock point to the opposite directions.

II. The hour hand is on 6.

Direction for questions 36 to 40: Each question is followed by two statements, I and II. Answer each question using the following instructions:

Choose "a"if the question can be answered by using the statement I alone, but not by using statement II alone.

Choose "b"if the question can be answered by using statement II alone, but not by using statement I alone.

Choose "c"if the question can be answered by using either statement alone.

Choose "d"if the question can be answered by using both the statements together, but cannot be answered by using either statement alone.

Choose "e"If the question cannot be answered even by using both statements together.

36. Is A the largest number among A, B and C?

I. A + C > 2B

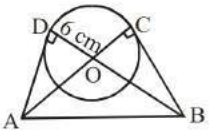
II. A – C > |B|

37. What is the value of a, given that a, b and c are three distinct positive integers?

I. $K^a \times K^b \times K^c = K^{abc}$

II. a > b > c

38. What is the area of circle in the figure ?



I. AD and BC are tangents

II. OD = 6 cm.

39. A line graph on a graph sheet shows the revenue for each year from 1990 through 1998 by points and joins the successive points by straight line segments. The point for revenue of 1990 is labelled A, that for 1991 as B, and that for 1992 as C and so on. What is the ratio of the growth in revenue between 1991-92 and 1990-91?

I. The angle between AB and X-axis when measured with a protractor is 40 degrees and the anglebetween CB and X-axis is 80 degrees.

II. The scale of Y axis is 1 cm = Rs. 1000

40. Is x > y?

I. x and y are real numbers.

II. $(1/5)^x < (1/5)^y$

Direction for questions 41: Each question is followed by two statements, I and II. Answer each question using the following instructions:

Choose "a"if the question can be answered by using the statement I alone, but not by using statement II alone.

Choose "b"if the question can be answered by using statement II alone, but not by using statement I alone.

Choose "c"if the question can be answered by using either statement alone.

Choose "d"if the question can be answered by using both the statements together, but cannot be answered by using either statement alone.

Choose "e"If the question cannot be answered even by using both statements together.

41. x, y and z define the function f(x, y, z) as the distance between X and Z from an equidistant point Y. What is f(a, b, c), where C is a point directly to the north of B and A is a point directly to east of B ?

I. Points A, B and C form an isosceles triangle.

II. Distance between A and B is 135 km.

Direction for questions 42 to 43: Each question is followed by two statements, I and II. Answer each question using the following instructions:

Choose "a"if the question can be answered by using the statement I alone, but not by using statement II alone.

Choose "b"if the question can be answered by using statement II alone, but not by using statement I alone.

Choose "c"if the question can be answered by using either statement alone.

Choose "d"if the question can be answered by using both the statements together, but cannot be answered by using either statement alone.

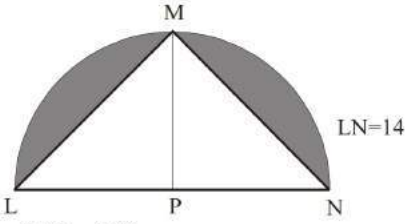
Choose "e"If the question cannot be answered even by using both statements together.

42. What is the price of mangoes per kilogramme ?

I. Ten kilogramme of mangoes and two dozens of oranges cost Rs. 252.

II. Two kilogramme of mangoes could be bought in exchange for one dozen oranges.

43. What is the area of the shaded portion of the half circle ? (Assume that P is the centre).



I. ∠MPL = 90°

II. ∠LMN = 90°

Direction for questions 44: Each question is followed by two statements, I and II. Answer each question using the following instructions:

Choose "a"if the question can be answered by using the statement I alone, but not by using statement II alone.

Choose "b"if the question can be answered by using statement II alone, but not by using statement I alone.

Choose "c"if the question can be answered by using either statement alone.

Choose "d"if the question can be answered by using both the statements together, but cannot be answered by using either statement alone.

Choose "e"If the question cannot be answered even by using both statements together.

44. What are the values of x and y?

I. $3x + 2y = 45$.

II. $10.5x + 7y = 130$.

Direction for questions 45 to 47: Each question is followed by two statements, I and II. Answer each question using the following instructions:

Choose "a"if the question can be answered by using the statement I alone, but not by using statement II alone.

Choose "b"if the question can be answered by using statement II alone, but not by using statement I alone.

Choose "c"if the question can be answered by using either statement alone.

Choose "d"if the question can be answered by using both the statements together, but cannot be answered by using either statement alone.

Choose "e"If the question cannot be answered even by using both statements together.

45. Which product A or B if sold gives more profit amount per item?

I. A gives a profit of 20per cent and B gives a profit of 30per cent.

II. Both A and B have the same selling price but profit percentage in the ratio 1 : 2.

46. What is the length of the line SQ which is the diagonal of a square as well as the diameter of a circle ?

I. All four vertices of the square lie on the circumference of the circle.

II. The numerical value of the area of the circle is twice the length of SQ.

47. Two birds are flying in opposite directions along the edge of a circle-shaped forest of radius 4 km. Both have to go to the same nest. Who reaches the nest first?

I. Speed of bird A is 60 kmph and speed of bird B is 50 kmph.

II. The nest is diametrically opposite to the starting point of the flight of the two birds, on the circumference of the forest.

Direction for questions 48: Each question is followed by two statements, I and II. Answer each question using the following instructions:

Choose "a"if the question can be answered by using the statement I alone, but not by using statement II alone.

Choose "b"if the question can be answered by using statement II alone, but not by using statement I alone.

Choose "c"if the question can be answered by using either statement alone.

Choose "d"if the question can be answered by using both the statements together, but cannot be answered by using either statement alone.

Choose "e"If the question cannot be answered even by using both statements together.

48. All trainees in a certain aviator-training programme must take both a written test and a flight test. If 70 per cent of the trainees passed the written test, and 80 per cent of the trainees passed the flight test, find out per cent of the trainees passed both tests.

I. Ten per cent of the trainees did not pass either test.

II. Twenty per cent of the trainees passed only the flight test.

ANSWERS

1. (c)	**2.** (d)	**3.** (d)	**4.** (e)	**5.** (e)	**6.** (a)	**7.** (d)	**8.** (a)	**9.** (b)	**10.** (c)
11. (e)	**12.** (e)	**13.** (a)	**14.** (a)	**15.** (b)	**16.** (e)	**17.** (e)	**18.** (c)	**19.** (d)	**20.** (d)
21. (d)	**22.** (d)	**23.** (e)	**24.** (b)	**25.** (a)	**26.** (c)	**27.** (d)	**28.** (d)	**29.** (c)	**30.** (e)
31. (e)	**32.** (d)	**33.** (a)	**34.** (d)	**35.** (b)	**36.** (b)	**37.** (d)	**38.** (d)	**39.** (e)	**40.** (b)
41. (b)	**42.** (d)	**43.** (a)	**44.** (e)	**45.** (d)	**46.** (a)	**47.** (d)	**48.** (c)		

SOLUTIONS

Level - 1

For questions 1 and 2:

If the car is blue then everyone is correct which is not so according to Aditya.

If the car is red, then everyone is wrong which is not so according to Aditya.

∴ The car is white colour.

The car is white means Virendar and Saurav both were correct.

1. c **2.** d **3.** d

4. e Assuming that the ages x, y and z of the 3 brothers are integers, (I) suggests that we can take, x =1, y = 3, z = 7 as 3 and 7 are the only prime factors of 21. So, we are able to answer the question using (I) alone, provided the ages are integers, which is not specifically given.

Using (II) we get $x + y + z \neq M$;

(II) alone also does not answer the question.

Combining (I) and (II), we can answer the question as 1, 3 and 7 years, provided the ages are integers. If the ages are not integers, even combining (I) and (II) does not answer the question uniquely. For we can have x = 1, y = 3, z = 7 or x = 1, y =7/3, z = 9, etc.

5. e Both statements (I) and (II) give the same value of r (rate) as given by the question itself. Since both statements do not give any additional information, the principal cannot be found.

6. a Using the first statement only. Second statement could imply that the figure ABCD is an isosceles trapezium.

7. d When SP are equal, loss % $= \frac{a^2}{100}\%$

$= \frac{(25)^2}{100}\% = 6.25\%$

8. a The equation of the tangent can be made by using point D and co-ordinates of point of contact of tangent and radius. From this the slope of the tangent gives the angle between the tangent and the x-axis. Hence, using A alone we can find the answer.

9. b Statement I alone is not sufficient. The length of each side of the original triangle is not given.

From statement II, we get

$h = \frac{\sqrt{3}}{2}a$ $\quad 10 = \frac{\sqrt{3}}{2}a$ or, $\quad a = \frac{20}{\sqrt{3}}$

Hence, we can find the area of the new triangle.

10. c A Þ The radius of circle is 3. B Þ R = 3. Þ Area of square is obtained in both the cases.

11. e Using both (I) and (II), we still cannot say anything about the number of students in the class.

12. e Statement (I) gives that the square of x is greater than the square of y. This does not inform us whether any of the numbers is positive or negative. For example. let x be –3 and y be 2. Even though y is > x ; $x^2 > y^2$. This renders the statement insufficient to solve the sum. Similarly, the second statement gives the ratio of the two numbers again shedding no light on the sign of the number. For example, x = – 9 and y = – 7. Hence, the answer can not be determined.

13. a Let us try statement (I)

Let the four numbers be 2n, 2n + 2, 2n + 4, 2n + 6.

Since, the average of the four numbers is 11, their sum is 44

$8n + 12 = 44$

$8n = 32$

$n = 4$

The number are 8, 10, 12 and 14.

Hence, the answer is (a)

14. a Statement (I) enables us to solve the sum, as we know the actual speed and the total distance between Merlin's house and his office. The second statement does not specify the quantity of time saved and hence is redundant. Thus, the correct answer choice is a.

15. b (I) is vague. (as A + B = B + A and A × B = B × A).
(II) gives the answer directly = 2.5

16. e (II) repeats (I), hence the question cannot be solved.

17. e Both statements are in sufficient as even if the professor is not a mathematician he may not add up two numbers correctly or he may add up three numbers correctly.

18. c From statement I, we get there are three sides and each side has 28 nails with one nail at each of the three vertices. Hence, total number of nails = (28 × 3) + 3 = 87.

From statement II, we get there are six sides and each side has 28 nails with one nail at each of the six vertices.

Hence, total number of nails = (28 × 6) + 6 = 174.

So, each statement independently is sufficient.

19. d Both the statements are needed. If the second statement is not given, we cannot find the water displaced by the immersed part of the cylinder, which leads to the rise in the water level.

20. d From statement I we know that A and B have passed the exam. Statement B is false so both C and D have ailed. Hence, using both we can say that two persons have passed the exam.

21. d

22. d I $\Rightarrow$ C = T + 5, II $\Rightarrow$ C = 3T – 5.

23. e Combining both statements,

$a^3 + b^3 = (a + b)(a^2 - ab + b^2)$

(a – b) is given and ab is given.

Hence, $a + b = \pm\sqrt{(a-b)^2 + 4xy}$

$= \pm\sqrt{64 + 80} = \pm 12$

Hence, we do not get a unique solution.

24. b Statement 1 simply informs us that there is a difference of 12 minutes between the actual time and the time shown by the clock and hence is not sufficient to obtain the solution to the problem. However, from the second statement we can easily deduce that for the entire day the clock will run faster by (24*4*35/60)= 56 minutes. Hence the correct answer choice is a.

25. a Using (I) alone, if a is the side of the regular hexagon, then 6a = 36 or a = 6 cm.

So, the area of the hexagon is $6 \times \frac{\sqrt{3}}{4}a^2$

$= 6 \times \frac{\sqrt{3}}{4} \times 36 = 54\sqrt{3}$ cm^2.

We can answer the question using (I) alone.

26. c I $\Rightarrow$ x = y = a, II $\Rightarrow$ x/y = R/1

$\Rightarrow$ (x+y)/(x–y) = (R+1)/(R–1) $\Rightarrow$ x + y can be obtained $\Rightarrow$ x and y can be obtained.

27. d Statement I and II separately does not give any information about the pass percentage. Let the number of boys and girls be x and y . Total students = x + y. Combining both, statements, we get

9x/10 + 9y/10 = 9 (x + y)/10, which gives the pass percentage.

= 90%.

28. d From II, q^2 = +ve

$pq^2 = 7q^2$

$7q^2$ is a positive quantity, which implies that p should be +ve.

29. c Each statement alone is sufficient. The first statement indicates it is a obtuse angled triangle and the second indicates it is a right-angled triangle.

30. e Combining both, statements even does not tell about p and r.

Level - 2

31. (e)

32. d Using (I) or (II) alone, cannot give the value of X. Let us combine both of them.

From (I) 2X + 2Y $\leq$ 40

From (II) – X + 2Y $\leq$ – 20

Subtracting, 3X $\leq$ 60 or X $\leq$ 20. So we get an idea about the value of X using both (I) and (II).

33. a From statement I, –5x + 5y = –5(x – y) is negative $\Rightarrow$ x > y

From statement II, we cannot determine.

34. d Statement II gives the volume of the spherical tank as 20 cu.m^2. From statement I we get the thickness of the wall, and hence, using both, we can work out the inner volume of the tank.

35. b From statement I, we cannot determine the time.

Statement II is sufficient to tell us it is 6 o' clock.

36. b Statement I indicates that B is not the largest number.

Statement II indicates that A > |B| + C $\Rightarrow$ A > B + C.

Hence, A is the largest number.

37. d From statement I, we have a + b + c = abc.

This is possible for positive integers if a, b and c are 1, 2 and 3 but we can't say the value of a.

From statement II, we have a > b > c.

Combining both statements, we can conclude a = 3.

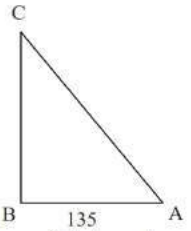
38. d OD becomes the radius if AD and BC are tangents.

39. e Using both A and B, we cannot find the growth in revenue for the 2 years.

40. b In statement II, the inequality holds true if both x, y are positive or both are negative and if x is positive and y is negative. Hence, true for all values of $x > y$

41. b Statement II is sufficient to answer.

So BC = 135 km hence AC = $\sqrt{(135)^2 + (135)^2}$



42. d Using (I) alone or (II) alone does not help to answer the question.

Combine (I) and (II). If 1 kg of mangoes and 1 dozen oranges respectively cost Rs. m and Rs. a, then (I) gives $10 m + 2a = 252$ or $5m + a = 126$

(II) gives $2m = a$.

Solving we get, $m = 18$. So one kg of mangoes cost Rs. 18

43. a (I) Implies that MP = 7 the height of DLMN thereby establishing that is on the circumference A (DLMN). Therefore, A (shaded region) = $\frac{\pi(7)^2}{2} - 49$.

44. e $\frac{a}{a'} = \frac{b}{b'}$ so system has no solution (3/105 = 2/7).

45. d From statement I, we do not know the selling price. From statement II, we know the selling price and profit percentage both.

46. a The data given in the statement i is already implied in the initial question.

Statement 11 gives

$$\pi\left(\frac{SQ}{2}\right)^2 = 2\ SQ \text{ or } SQ = \frac{8}{\pi}$$

47. d Statement I gives the speed comparison only.

Statement II gives that the distance covered is the same.

Hence, combining the two statements, we can find out that bird A reaches the nest first.

48. c From (I), 90 per cent of the trainees passed at least one of the tests. Since, 80 per cent passed the flight test, 10 per cent (90 - 80) passed only the written test. Therefore, among those who passed the written test (70 per cent), 60 per cent (70 - 10) passed both the tests. Therefore, (I) alone is sufficient.

From (II), among those who passed the flight test (80 per cent), 20 per cent passed only the flight test. So, the remaining 60 per cent passed both the tests.

Therefore, (II) is also sufficient.

Hence, (c) is the answer.

PREVIOUS YEARS QUESTIONS

Level - 1

1990

Direction for Question 1: *The question is followed by two statements. MARK,*

(a) if the question can be answered with the help of statement I alone,

(b) if the question can be answered with the help of statement II alone,

(c) if both, statement I and statement II are needed to answer the question, and

(d) if the statement cannot be answered even with the help of both the statements.

1. X is older than Y, Z is younger than W and V is older than Y. Is Z younger than X?

I. W may not be older than V.

II. W is not older than V.

1997

Direction for Question 2: *The question is followed by two statements, I and II. Mark the answer*

(a) if the question can be answered with the help of one statement alone.

(b) if the question can be answered with the help of any one statement independently.

(c) if the question can be answered with the help of both statements together.

(d) if the question cannot be answered even with the help of both statements together.

2. Three friends P, Q and R are wearing hats, either black or white. Each person can see the hats of the other two persons. What is the colour of P's hat?

I. P says that he can see one black hat and one white hat.

II. Q says that he can see one white hat and one black hat.

2000

Direction for Question 3: *The question is followed by two statements, I and II. Answer the question using the following instructions.*

Mark the answer as

(a) if the question can be answered by one of the statements alone, but cannot be answered by using the other statement alone.

(b) if the question can be answered by using either statement alone.

(c) if the question can be answered by using both the statements together, but cannot be answered by using either statement alone.

(d) if the question cannot be answered even by using both statements together.

3. Consider three real numbers, X, Y and Z. Is Z the smallest of these numbers?

I. X is greater than at least one of Y and Z.

II. Y is greater than at least one of X and Z.

2002

Direction for Question 4: *The question is followed by two statements, A and B. Answer the question using the following instructions.*

Choose (a) if the question can be answered by one of the statements alone but not by the other.

Choose (b) if the question can be answered by using either statement alone.

Choose (c) if the question can be answered by using both the statements together, but cannot be answered by using either statement alone.

Choose (d) if the question cannot be answered even by using both statements together.

4. In a hockey match, the Indian team was behind by 2 goals with 5 min remaining. Did they win the match?

A. Deepak Thakur, the Indian striker, scored 3 goals in the last 5 min of the match.

B. Korea scored a total of 3 goals in the match.

2003

Direction for Question 5: *In the question there are two statements: A and B.*

Choose (a)if the question can be answered by one of the statements alone but not by the other.

Choose (b)if the question can be answered by using either statement alone.

Choose (c)if the question can be answered by using both the statements together but cannot be answered using either statement alone.

Choose (d)if the question cannot be answered even by using both the statements A and B.

5. F and M are father and mother of S, respectively. S has four uncles and three aunts. F has two siblings. The siblings of F and M are unmarried. How many brothers does M have?

A. F has two brothers.

B. M has five siblings.

MEMORY BASED QUESTIONS

2010

6. The question given below is followed by two statements, A and B. Mark the answer using the following instructions:

Mark (a) if the question can be answered by using either statement alone.

Mark (b) if the question can be answered by using one of the statements alone, but cannot be answered by using the other statement alone.

Mark (c) if the question cannot be answered even by using both the statements together.

Mark (d) if the question can be answered by using both the statements together, but cannot be answered by using either statement alone.

Q. ABCDEF is a hexagon in which all the interior angles are equal. If AB = 20 cm and DE = 10 cm, then what is the perimeter of the hexagon?

A. The shortest distance between AB and DE is 30 cm.

B. The line joining the midpoints of AB and DE is perpendicular to both AB and DE.

7. The question given below is followed by two statements, A and B. Mark the answer using the following instructions:

Mark (a) if the question can be answered by using one of the statements alone, but cannot be answered by using the other statement alone.

Mark (b) if the question can be answered by using either statement alone.

Mark (c) if the question can be answered by using both the statements together, but cannot be answered by using either statement alone.

Mark (d) if the question cannot be answered even by using both the statements together.

Q. ABCD is a cyclic quadrilateral in which AB = 8 cm and BC = 15 cm. What is the area of the quadrilateral?

A. AD = CD

B. The length of the diameter of the circumcircle of triangle BCD is 17 cm.

2011

8. The question given below is followed by two statements, A and B. Mark the answer using the following instructions:

Mark (a) if the question can be answered by using one of the statements alone, but cannot be answered by using the other statement alone.

Mark (b) if the question can be answered by using either statement alone.

Mark (c) if the question cannot be answered even by using both the statements together.

Mark (d) if the question can be answered by using both the statements together, but cannot be answered by using either statement alone.

Q. If p and q are natural numbers, then what is the remainder when (p + q) is divided by 7?

A. $6q - p = 5$

B. $8q + p = 45$

Level - 2

1991

Direction for Question 9 : *The question is followed by two statements. As the answer,*

Mark (a), If the question can be answered with the help of statement I alone,

Mark (b), If the question can be answered with the help of statement II alone,

Mark (c), If both the statement I and statement II are needed to answer the question, and

Mark (d), If the question cannot be answered even with the help of both the statements.

9. Mr. Murthy takes the morning train to his office from station A to station B, and his colleague Mr.Rahman joins him on the way. There are three stations C, D and E on the way not necessarily in that sequence. What is the sequence of stations?

I. Mr. Rahman boards the train at D.

II. Mr. Thomas, who travels between C & D has two segments of journey in common with Mr. Murthy but none with Mr. Rahman.

1998

Directions for Questions 10 and 11: *Each question is followed by two statements, I and II. Answer the questions based on the statements and mark the answer as*

(a) if the question can be answered with the help of any one statement alone but not by the other statement.

(b) if the question can be answered with the help of either of the statements taken individually.

(c) if the question can be answered with the help of both statements together.

(d) if the question cannot be answered even with the help of both statements together.

10. There are four envelopes — E_1, E_2, E_3 and E_4 — in which one was supposed to put letters L_1, L_2, L_3 and L_4 meant for persons C_1, C_2, C_3 and C_4 respectively, but by mistake the letters got jumbled up and went in wrong envelopes. Now if C_2 is allowed to open an envelope at random, then how will he identify the envelope containing the letter for him?

I. L_2 has been put in E_1.

II. The letter belonging to C_3 has gone in the correct envelope.

11. There are four racks numbered 1, 2, 3, 4 and four books numbered 1, 2, 3, 4. If an even rack has to contain an odd-numbered book and an odd rack contains an even-numbered book, then what is the position of book 4?

I. Second book has been put in third rack.

II. Third book has been put in second rack.

2003 (R)

Directions for Questions 12 and 13: *Each question is followed by two statements, A and B. Answer each question using the following instructions:*

Choose (a) if the question can be answered by using statement A alone but not by using B alone.

Choose (b) if the question can be answered by using statement B alone but not by using A alone.

Choose (c) if the question can be answered by using either statement alone and

Choose (d) if the question can be answered using both the statements together but not by either statement alone.

12. In a cricket match, the 'Man of the Match' award is given to the player scoring the highest number of runs. In case of a tie, the player (out of those locked in the tie) who has taken the higher number of catches is chosen. Even thereafter if there is a tie, the player (out of those locked in the tie) who has dropped fewer catches is selected. Aakash, Biplab, and Chirag who were contenders for the award dropped at least one catch each. Biplab dropped two catches more than Aakash did, scored 50, and took two catches. Chirag got two chances to catch and dropped both. Who was the 'Man of the Match'?

A. Chirag made 15 runs less than both Aakash and Bipla2.

B. The catches dropped less by Biplab are 1 more than the catches taken by Aakash.

13. Four friends — A, B, C and D got the top four ranks in a competitive examination, but A did not get the first, B did not get the second, C did not get the third, and D did not get the fourth rank. Who secured which rank?

A. Neither A nor D were among the first 2.

B. Neither B nor C was third or fourth.

2003 (L)

Direction for question 14 : *The question has two statements: A and B.*

Choose (a) if the question can be answered by one of the statements alone but not by the other.

Choose (b) if the question can be answered by using either statement alone.

Choose (c) if the question can be answered by using both the statements together but cannot be answered using either statement alone.

Choose (d) if the question cannot be answered even by using both the statements A and B.

14. A game consists of tossing a coin successively. There is an entry fee of Rs. 10 and an additional fee of Re. 1 for each toss of coin. The game is considered to have ended normally when the coin turns heads on two consecutive throws. In this case the player is paid Rs. 100. Alternatively, the player can choose to terminate the game prematurely after any of the tosses. Ram has incurred a loss of Rs. 50 by playing this game. How many times did he toss the coin?

A. The game ended normally.

B. The total number of tails obtained in the game was 138.

2004

Directions for Questions 15 and 16: *Each question is followed by two statements, A and B. Answer each question using the following instructions.*

Choose (a)if the question can be answered by using one of the statements alone but not by using the other statement alone.

Choose (b)if the question can be answered by using either of the statements alone.

Choose (c)if the question can be answered by using both statements together but not by either statement alone.

Choose (d)if the question cannot be answered on the basis of the two statements.

15. Four candidates for an award obtain distinct scores in a test. Each of the four casts a vote to choose the winner of the award. The candidate who gets the largest number of votes wins the award. In case of a tie in the voting process, the candidate with the highest score wins the award. Who wins the award?

A. The candidates with top three scores each vote for the top score amongst the other three.

B. The candidate with the lowest score votes for the player with the second highest score.

16. In a class of 30 students, Rashmi secured the third rank among the girls, while her brother Kumar studying in the same class secured the sixth rank in the whole class. Between the two, who had a better overall rank?

A. Kumar was among the top 25% of the boys merit list in the class in which 60% were boys.

B. There were three boys among the top five rank holders, and three girls among the top ten rank holders.

2007

Direction for Question 17 : *The question is followed by two statements, A and B.*

Answer the question using the following instructions:

Mark (a) if the question can be answered by using the statement A alone but not by using the statement B alone.

Mark (b) if the question can be answered by using the statement B alone but not by using the statement A alone.

Mark (c) if the question can be answered by using either of the statements alone.

Mark (d) if the question can be answered by using both the statements together but not by either of the statements alone.

Mark (e) if the question cannot be answered on the basis of the two statements.

17. Five students Atul, Bala, Chetan, Dev and Ernesto were the only ones who participated in a quiz contest. They were ranked based on their scores in the contest. Dev got a higher rank as compared to Ernesto, while Bala got a higher rank as compared to Chetan. Chetan's rank was lower than the median. Who among the five got the highest rank?

A. Atul was the last rank holder.

B. Bala was not among the top two rank holders.

Direction for Questions 18: *The question is followed by two statements, A and B.*

Answer each question using the following instructions:

Mark (a) if the question can be answered by using the statement A alone but not by using the statement B alone.

Mark (b) if the question can be answered by using the statement B alone but not by using the statement A alone.

Mark (c) if the question can be answered by using either of the statements alone.

Mark (d) if the question can be answered by using both the statements together but not by either of the statements alone.

Mark (e) if the question cannot be answered on the basis of the two statements.

18. In a football match, at the half-time, Mahindra and Mahindra Club was trailing by three goals. Did it win the match?

A. In the second-half Mahindra and Mahindra Club scored four goals.

B. The opponent scored four goals in the match.

MEMORY BASED QUESTIONS

2009

19. The question given below is followed by two statements, A and B. Mark the answer using the following instructions:

Mark (a) if the question can be answered by using Statement A alone, but cannot be answered by using Statement B alone.

Mark (b) if the question can be answered by using Statement B alone, but cannot be answered by using Statement A alone.

Mark (c) if the question cannot be answered even by using both the statements together.

Mark (d) if the question can be answered by using either statement alone.

Q. Uncle Gomes distributes 40 candies among five children in such a way that each child gets at least one candy and no two children get the same number of candies. What is the number of candies received by the child who gets the maximum number of candies among the five children?

A. Each child gets more than 4 candies.

B. The sum of the number of candies received by the child who gets the maximum and the child who gets the minimum number of candies among the five children is 29.

20. The question given below is followed by two statements, A and B. Mark the answer using the following instructions:

Mark (a) if the question can be answered by using one of the statements alone, but cannot be answered by using the other statement alone.

Mark (b) if the question can be answered by using either statement alone.

Mark (c) if the question can be answered by using both the statements together, but cannot be answered by using either statement alone.

Mark (d) if the question cannot be answered even by using both the statements together.

Q. Some students are standing in a row facing the West direction. Fourteen students are standing to the left of Mukesh and twenty two students are standing to the right of Rakesh. How many students are there in all?

A. Exactly 5 students are standing between Mukesh and Rakesh.

B. The total number of students is a prime number less than 37.

2010

21. The question given below is followed by two statements, A and B. Mark the answer using the following instructions:

Mark (a) if the question can be answered by using one of the statements alone, but cannot be answered by using the other statement alone.

Mark (b) if the question can be answered by using either statement alone.

Mark (c) if the question can be answered by using both the statements together, but cannot be answered by using either statement alone.

Mark (d) if the question cannot be answered even by using both the statements together.

Q. The houses of Pavan, Pranab, Mohit and Santosh are of different sizes and each house has some vehicle parking slots. Pavan stays in the second smallest house, which has the same number of parking slots as that in Pranab's house. The largest house is not the one with the highest number of parking slots. Santosh's house is not the smallest. The sum of the number of parking slots in Mohit's house and Pranab's house is an even number. Who among the four stays in the second largest house and how many parking slots does it have?

A. One house has two parking slots and the remaining three houses have one parking slot each.

B. The four houses have two, three, three and five parking slots, in no particular order.

2011

22. The question given below is followed by two statements, A and B. Mark the answer using the following instructions:

Mark (a) if the question can be answered by using either statement alone.

Mark (b) if the question can be answered by using one of the statements alone, but cannot be answered by using the other statement alone.

Mark (c) if the question cannot be answered even by using both the statements together.

Mark (d) if the question can be answered by using both the statements together, but cannot be answered by using either statement alone.

Q. What is the sum of a, b and c?

A. The numbers a, b and c are in Arithmetic Progression.

B. $a^2 + b^2 + c^2 = 83$, where a, b and c are natural numbers.

23. The question given below is followed by two statements, A and B. Mark the answer using the following instructions:

Mark (a) if the question can be answered by using Statement A alone, but cannot be answered by using Statement B alone.

Mark (b) if the question can be answered by using Statement B alone, but cannot be answered by using Statement A alone.

Mark (c) if the question can be answered by using either statement alone.

Mark (d) if the question cannot be answered by any of the two statements.

Q. Four friends – Ajay, Bikas, Chetan and Deepak – have different surnames among Rathore, Agarwal, Yadav and Sharma, not necessarily in the same order. They are standing in a queue one after the other. Either Rathore or Agarwal is standing immediately in front of Ajay and the other is standing immediately behind Ajay. Bikas and Chetan are standing at the two ends of the queue. What is the surname of Ajay?

A. The surname of Chetan is Agarwal.

B. The surname of Bikas is Yadav.

24. The question given below is followed by two statements, A and B. Mark the answer using the following instructions:

Mark (a) if the question can be answered by using Statement A alone, but cannot be answered by using Statement B alone.

Mark (b) if the question can be answered by using Statement B alone, but cannot be answered by using Statement A alone.

Mark (c) if the question can be answered by using either statement alone.

Mark (d) if the question cannot be answered by any of the two statements.

Q. Five people having different ages are standing in a row. They are Engineer, Professor, Manager, Doctor and Lawyer respectively by profession. The oldest among them is standing in the middle of the row and he is not a Lawyer. The youngest among them is an Engineer and he is not standing at any of the two ends of the row. The Professor is younger than exactly three people and he is standing at one of the ends of the row. The Doctor is standing beside the Engineer. The Lawyer is standing beside the Doctor. The Manager is standing beside the Lawyer. How many people are younger than the Manager?

A. The Lawyer is younger than the Doctor.

B. The Manager is younger than the Lawyer.

Level - 3

1999

Directions for Questions 25 to 27: *Each question is followed by two statements I and II.*

Mark:

(a) if the question can be answered by any one of the statements alone, but cannot be answered by using the other statement alone.

(b) if the question can be answered by using either statement alone.

(c) if the question can be answered by using both the statements together, but cannot be answered by using either statement alone.

(d) if the question cannot be answered even by using both the statements together.

25. Three professors A, B and C are separately given three sets of numbers to add. They were expected to find the answers to 1 + 1, 1 + 1 + 2, and 1 + 1 respectively. Their respective answers were 3, 3 and 2. How many of the professors are mathematicians?

I. A mathematician can never add two numbers correctly, but can always add three numbers correctly.

II. When a mathematician makes a mistake in a sum, the error is +1 or –1.

26. How many students among A, B, C and D have passed the examination?

I. The following is a true statement: A and B passed the examination.

II. The following is a false statement: At least one among C and D has passed the examination.

27. Mr Mendel grew 100 flowering plants from black seeds and white seeds, each seed giving rise to one plant. A plant gives flowers of only one colour. From a black seed comes a plant giving red or blue flowers. From a white seed comes a plant giving red or white flowers. How many black seeds were used by Mr Mendel?

I. The number of plants with white flowers was 10.

II. The number of plants with red flowers was 70.

ANSWERS

1. (d)	**2.** (d)	**3.** (c)	**4.** (d)	**5.** (a)	**6.** (b)	**7.** (d)	**8.** (b)	**9.** (c)	**10.** (a)
11. (a)	**12.** (d)	**13.** (c)	**14.** (b)	**15.** (a)	**16.** (a)	**17.** (d)	**18.** (e)	**19.**(b)	**20.** (c)
21. (a)	**22.** (d)	**23.** (b)	**24.** (b)	**25.** (d)	**26.** (c)	**27.** (d)			

SOLUTIONS

Level - 1

1. d X > Y, Z < W and V > Y. If we were to look at all of them we can say that, X,V > Y & W > Z. The first statement gives a uncertain situation using "may", hence we cannot definitely say about the answer. The second statement says, V > W and hence V > Z. This again does not say anything because we do not know whether X>Z or X<Z. Hence, the answer is (d)

2. d P says he can see one black and one white hat. So either Q is wearing white and R is wearing black, or Q is wearing black and R is wearing white. Q also makes same statement. Still we cannot say the colour of the hat which P is wearing.

3. c Statement I implies X > Y or X > Z or X > Y and Z
Statement II implies Y > X or Y > Z or Y > X and Z.

Combining both statements, we can get Y > X > Z or X > Y > Z. Hence, Z is the smallest.

4. d From statement A, we know only the number of goals made by India is the last 5 minutes. But, as we don't know what the opponent team did in the last 5 minutes, we can't conclude anything. So statement A alone is not sufficient.

Similarly, statement B does not talk about the total number of goals scored by India. So statement B is not sufficient.

Using both the statements, we have two possibilities:

(I) If Korea had scored 3 goals 5 minutes before the end of the match India would have scored 1 goal. In the last 5 minutes as India made 3 goals and Korea on the whole made 3 goals, we can conclude that India had won the game.

(II) If Korea had scored 3 goals 5 minutes before the end of the match, India would have scored zero goals. In the last 5 minutes, as India made 3 goals and Korea on the whole made 3 goals, we can say the match was drawn.

Hence, we cannot answer the question even boy using both the statements together.

5. a S has 4 uncles and from statement A. F has two brothers. Hence, the other 2 uncles of S must be the brothers of M. Statement B does not give any additional information.

MEMORY BASED QUESTIONS

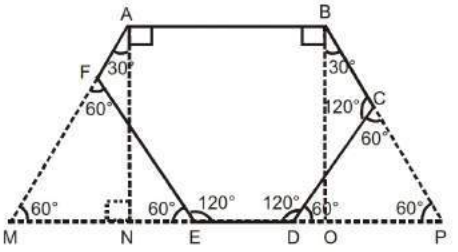
6. b Since all the interior angles are equal (given), each interior angle must be 120^0. Though ABCDEF is not a regular hexagon (as AB is not equal to DE), the opposite sides would still be parallel.

From Statement A:

The shortest distance, d, between parallel lines is given as 30cm.

However it can be observed that exact position of the points D and E are still not known w.r.t. AB.

Let us draw one of the possible hexagons ABCDEF:



Here AF and BC may or may not be equal.

AF, BC and ED are extended to meet at points M and P (see the figure).

Also, AN and BO are perpendiculars drawn from A and B on ED extended.

It can be observed that both the triangles FME and DCP are equilateral.

Hence, AF + FE = AF + FM = AM

$$= \frac{AN}{\cos 30^\circ} = \frac{d}{\cos 30^\circ}$$

Similarly, BC + CD = BC + CP = BP

$$= \frac{BO}{\cos 30^\circ} = \frac{d}{\cos 30^\circ}$$

It can be observed that 'AF + FE' and 'BC + DC' both are same and also unique for all possible hexagons ABCDEF.

Hence, despite having many possible hexagons ABCDEF, the perimeter:

$$= 20 + 10 + \frac{2d}{\cos 30^\circ} = 99.28 \text{ cm}$$

(will be constant)

Hence, Statement A alone is sufficient to answer.

From Statement B:

Since Statement B gives no information about the distance between AB and DE, it is insufficient to calculate the perimeter of the hexagon.

7. d **From Statement A:**

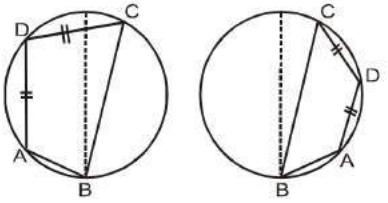
Since we do not know the angle between AB and BC, infinitely many cyclic quadrilaterals ABCD are possible, where AB = 8 cm, BC = 15 cm and AD = CD. Hence, this statement alone cannot answer the question.

From Statement B:

Circumcircle of BCD is also the circumcircle of ABCD. Since we do not know the lengths of AD and CD, infinitely many cyclic quadrilaterals ABCD are possible. Hence, this statement also cannot answer the question alone.

Combining Statements A and B:

In a circle of diameter 17 cm, construct a chord BC = 15 cm. This chord divides the circle into two unequal parts. On both these parts, chord AB of length 8 cm can be drawn. Even if AD = CD, we can arrive at two different quadrilaterals ABCD (see the figures given below). Hence, the question cannot be answered even by using both the statements together.



8. b **From Statement A:**

$$6q - p = 5$$
$$p = 6q - 5$$
$$p + q = 7q - 5$$

(7q – 5) when divided by 7 leaves remainder 2.

This statement alone is sufficient to answer the question.

From Statement B:

$$8q + p = 45$$
$$p = 45 - 8q$$
$$p + q = 45 - 7q$$

(45 – 7q) when divided by 7 leaves remainder 3.

This statement alone is sufficient to answer the question.

Level - 2

9. c From statement I alone no conclusion can be drawn.

From statement II following sequence of stations is possible

A	C/D	E	C/D	B

But, from I, Mr. Rahman boards the station at D which is possible at fourth position only because Mr. Thomas and Mr. Rahman have no common station.

10. a The issue at hand is to make C_2 identify in which envelope is the letter L_2. The first statement actually tells him this. Hence, it alone is sufficient to answer the question. The second statement only implies that his letter would be in either E_1, E_2 or E_4 and hence is not sufficient to answer the question.

11. a From the question itself, we can figure out that book 4 can either be in rack 1 or rack 3. The first statement says that book 2 has been kept in rack 3. Hence, book 4 has to be kept in rack 1. So this statement is sufficient to answer the question. The second statement, however, does not add any additional information to what we already know. As books 3 in rack 2 would still imply book 4 can be in rack 1 or 3.

12. d From statement A, both Aakash and Biplab have the same scores. But we cannot find the man of the match.

From statement B only, we cannot find the man of the match.

Combining both statements we can find the man of the match i.e. Aakash.

13. c From statement A, their ranks will be A - 4, B -1, C - 2, D - 3.

From statement B, also their ranks will be A - 4, B -1, C - 2, D - 3.

14. b If Ram tossed the coin x number of times, then from statement A, we get the equation $10 + x - 100 = 50$. Thus, $x = 140$.

From statement II individually, we have $x > 138$.

Thus, we are sure that he has paid up more than 148. If he incurs a loss of only Rs. 50, the game has to end normally. Thus, he must have played 150 shots and got first 138 as tails and 139 and 140 throws as heads. With no other scenario, a loss of just Rs.50 and 138 tails will show up.

15. a Assume A, B, C, D gets score 10, 8, 6, 4 respectively.

A B C D

10 8 6 4

Statement A:

With the conditions, A will give vote to B

With the conditions, B will give vote to A

With the conditions, C will give vote to A

Even if D gives to A/B/C - 2 situation arises.

Either A will win or there will a tie when D gives vote to B.

Even then A will win.

So we are getting the answer.

Statement B: Nothing concrete can be derived.

16. a Statement A: Nothing can be said.

Statement B: Since there are 3 boys in the top 5 rank holders, the other two are girls and Rashmi is not one of them. As Kumar is ranked sixth, Rashmi is either seventh or below. Hence, statement II alone is sufficient.

17. d Statements A and B alone are not sufficient but if both are combined, then we can form the following sequence:

1	2	3	4	5
D	E	B	C	A

So the answer is (d).

18. e Statement A alone is not sufficient because it is not giving any information about the opponent. Statement B alone is also not sufficient because it is not giving any information regarding the performance of Mahindra & Mahindra in the second half. Even if both the statements are used together, we will get two cases:

M & M	0	1
Opponent	3	4

So in one case, match is drawn and in the other case, it is won by Mahindra & Mahindra.

Hence, the answer is (e)

19.b **From Statement A:**

There are multiple possibilities:

6, 7, 8, 9, 10

5, 7, 8, 9, 11 etc.

So the answer cannot be determined using A alone.

From Statement B:

There are only two possible cases:

(i) 1, 2, 4, 5, 28

(ii) 1, 2, 3, 6, 28

In both the cases the answer will be 28.

20. c **From Statement A:**

Two cases are possible (x means x students):

(i) 14 Mukesh 5 Rakesh 22

This gives a total of 14 + 1 + 5 + 1 + 22

= 43 students.

(ii) 8 Rakesh 5 Mukesh 16.

This gives a total of 8 + 1 + 5 + 1 + 16

= 31 students.

From Statement B:

Three cases are possible:

(i) Rakesh 13 Mukesh 8

This gives a total of 1 + 13 + 1 + 8

= 23 students.

(ii) 6 Rakesh 7 Mukesh 14

This gives a total of 6 + 1 + 7 + 1 + 14

= 29 students.

(iii) 8 Rakesh 5 Mukesh 16

This gives a total of 8 + 1 + 5 + 1 + 16

= 31 students.

Combining Statement A and Statement B:

The answer has to be 31.

21. a **From Statement A:**

As the sum of the number of parking slots in Mohit's house and Pranab's house is an even number, the number of parking slots in each of Pavan, Pranab and Mohit's house is one and the number of parking slots in Santosh's house is two. Also, Santosh must be staying in the second largest house. Hence, this statement alone can answer the question.

From Statement B:

The houses of Pavan, Pranab, Mohit and Santosh have three, three, five and two parking slots respectively. It is also known that the largest house cannot have five parking slots. But we cannot deduce anything about the second largest house. Hence, this statement alone cannot answer the question.

22. d **From Statement A:**

Statement A alone is clearly insufficient to answer the question.

From Statement B:

$$a^2 + b^2 + c^2 = 83$$

Case I:

$$(a, b, c) = (1, 1, 9)$$

Case II:

$$(a, b, c) = (3, 5, 7)$$

Statement B alone is also not sufficient to answer the question.

From Statements A and B:

The values of (a, b, c) are (3, 5, 7) and the sum of a, b and c is 15.

23. b The given information can be shown as:

Name	-	Ajay	-
Surname	Rathore/Agarwal	-	Agarwal/Rathore

Therefore, the surame of Ajay is either Yadav or Sharma.

From Statement A:

The surname of Chetan is Agarwal; but we still cannot conclude anything about the surname of Ajay. This statement alone is not sufficient to answer.

From Statement B:

The surname of Bikas is Yadav; therefore, the surname of Ajay is Sharma. This statement alone is sufficient to answer.

24. b Let the ages of the five people, from youngest to oldest, be represented by A1, A2, A3, A4 and A5 respectively. From the given information it can be concluded that the age of the Engineer is A1 and the age of the Professor is A2. As the age of the Lawyer is not A5 and he is standing between the Manager and the Doctor, the Manager must be standing at one of the ends of the row and the Professor must be standing at the other end of the row. The tables given below show the two possible cases.

Age	A2	A1	A5	-	-
Profession	Professor	Engineer	Doctor	Lawyer	Manager

or

Age	-	-	A5	A1	A2
Profession	Manager	Lawyer	Doctor	Engineer	Professor

From Statement A:

The given information is already present in the root of the question. This statement alone is not sufficient to answer.

From Statement B:

As the Manager is younger than the Lawyer, the age of the Manager must be A3. Hence, exactly two people are younger than him. This statement alone is sufficient to answer.

Level - 3

25. d

A	B	C
1 + 1	1 + 1 + 2	1 + 1
3	3	2

Statement I: As C added up two numbers correctly, he is not a mathematician. However, from the given information, it is not necessary that any person who adds up two numbers incorrectly is a mathematician. Therefore, A or B may or may not be mathematicians.

Hence, statement I alone is not sufficient.

Statement II: If a mathematician makes a mistake in a sum, the error is +1 or -1. But it doesn't implies that if a person makes an error of +1 or -1, he is a mathematician.

Hence, statement II alone is not sufficient.

Even on combining the two statements, we cannot conclude anything concrete.

26. c From I, we know A and B passed the examination.

From II, we know the condition that among C and D at least one passed (or both passed) is false.

Therefore, it is obvious that both C and D have failed. Thus, both statements are necessary to find the answer.

27. d Statement I gives us the number of white flowers. But we know that a white seed gives both red or white flowers. Thus, proving statement II, gives the number of red flowers. But both black and white seeds give red flowers, again providing no solutions.

■■