MENTAL ABILITY

1. In a class of 60 where boys are twice that of girls, Ramya ranked 17th from the top. If there are 9 boys ahead of Ramya, how many girls are there after her in the rank?

(1) 26 (2) 12

(3) 10 (4) 33

2. A child went 90 m in the East to look for his father, then he turned right and went 20 m. After he turned right and after going 30 m, he reached to his uncle's house. His father was not there he went 100 m to his North and met his father in the shop. How far did he meet his father from the starting point ?

(1) 100 m (2) 80 m

(3) 140 m (4) 260 m

3. RUST = 9 – 6 – 8 – 7 and BOARD = 25 – 12 – 26 – 9 – 23, how will you code 'BEAT'?

(1) 25 – 23 – 24 – 7 (2) 25 – 21 – 26 – 7

(3) 25 – 22 – 25 – 7 (4) 25 – 22 – 26 – 7

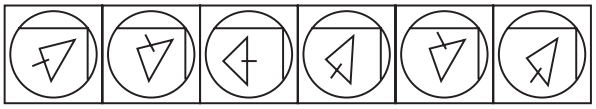
4. Choose the correct alternative that will continue the given pattern:

0.5, 0.55, 0.65,

(1) 0.9 (2) 0.82

(3) 1 (4) 0.95

5. Find the odd one amongst the set figures of a series.



(1) Q

(2) R

(3) T

(4) U

6. A lady is 5 years younger to her husband and he is 5 times as old as his daughter. If the daughter was 5 years old 3 years back, what is the present age of the lady?

(1) 25 (2) 45

(3) 35 (4) 30

7. Two cars start from the opposite places of a main road, 150 km apart. First car runs for 25 km and takes a right turn and then runs 15 km. It then turns left and then runs for another 25 km the direction back to reach the main road. In the mean time, due to minor break down the other car has run only 35 km along the main road. What would be the distance between two cars at this point?

(1) 85 km (2) 75 km

(3) 80 km (4) 65 km

8. If 'A $ B' means 'A is the father of B', 'A * B' means 'A is the mother of B', 'A @ B' means 'A is the wife of B', then which of the following means 'M is the grandmother of N'?

(1) M*T$N@R (2) M*T$R@S

(3) M*R$T@N (4) M*R@T@N

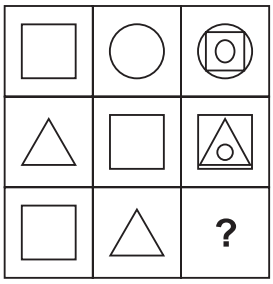
9. Find the next shape.

22	M	11	F	4
R	16	I	7	D

(1) D / 2 (2) C / 1

(3) C / 2 (4) C / 3

10. In the matrix there are eight designs and one space is left blank as shown by a question mark. Which answer figures will replace the question mark?



(1) (2)

(3) (4)

11. A trader purchases 70 kg of tea at ₹ 15 per kg and 30 kg of tea at ₹ 18.50 per kg. If the packing charges are 2 %, then at what price he must sell the mixture of two to gain 15%?

(1) ₹ 18.82 per kg (2) ₹ 18 per kg

(3) ₹ 18.50 per kg (4) ₹ 17.8 per kg

12. $(16)^{3/4}$ is equal to:

(1) 2 (2) 4

(3) 8 (4) 16

13. Find the value of p such that $(x - 1)$ is the factor of the polynomial $x^3 + 10x^2 + px$.

(1) $p = 7$ (2) $p = -7$

(3) $p = -11$ (4) $p = 11$

14. Which graph is parallel to x-axis?

(1) $y = x + 1$ (2) $y = 2$

(c) $x = 3$ (4) $x = 2y$

15. The graph of which of the following equations passes through the origin?

(1) $y = 2x + c$

(2) $y = 2x - c$

(3) $y = 2x$

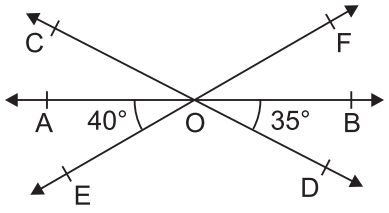
(4) $x = 2y + d$

16. If the point (3, 4) lies on the graph of the equation $3y = ax + 7$. Find the value of a?

(1) 5/3 (2) 2/3

(3) 1/2 (4) 2

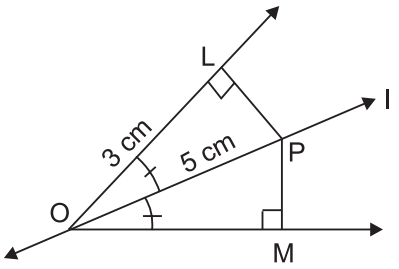
17. If the given figure, lines AB, CD and EF intersect at O. Find the measure of ∠COF?



(1) 110 (2) 115

(3) 95 (4) 105

18. In the given figure, find PM.



(1) 3 cm (2) 5 cm

(3) 4 cm (4) 2 cm

19. The angles of a quadrilateral are in the ratio 3 : 5 : 9 : 13. Find the least angles of the quadrilateral.

(1) 36° (2) 40°

(3) 40° (4) 72°

20. Which of the following is not true?

(1) Every square is a rectangle.

(2) Every rectangle is a quadrilateral.

(3) Every parallelogram is a trapezium.

(4) None of these

21. Which of the following angle can be constructed with the help of a ruler and a pair of compasses?

(1) 35° (2) 40°

(3) 37.5° (4) 47.5°

22. What is the length of each side of an equilateral triangle having an area of $4\sqrt{3}$ cm^2?

(1) 4 cm (2) 5 cm

(3) 7 cm (4) 6 cm

23. A chord of a circle is equal to its radius. Then the angle subtended by the chord at the centre of the circle is

(1) 120° (2) 150°

(3) 60° (4) 90°

24. In a cylinder, radius is doubled and height is halved. Then the curved surface area will be

(1) halved (2) doubled

(3) four times (4) same

25. If the mean of x, $x+3$, $x+5$, $x+7$ and $x+10$ is 9 then what is the means of last three observations?

(1) $9\frac{4}{5}$ (2) $10\frac{1}{2}$

(3) $11\frac{1}{3}$ (4) 12

26. Probability of drawing an ace from a deck of 52 cards is

(1) 1/13 (2) 1/26

(3) 1/52 (4) 3/52

27. Find the value of

$$\frac{9^{3/2}-3\times5^{0}\left[\frac{1}{81}\right]^{-1/2}}{\left(\frac{64}{125}\right)^{-2/3}+\frac{1}{\left(\frac{256}{625}\right)^{1/4}}+\left(\frac{\sqrt{25}}{\sqrt[3]{64}}\right)}$$

(1) 15/13 (2) 0

(3) 16/5 (4) 48/13

28. Which point lies to the right of y-axis?

(1) (0,3) (2) (–2,–1)

(3) (3,5) (4) (–3,–2)

29. If $x^2+\frac{1}{x^2}=18$ then find the value of $x-\frac{1}{x}$.

(1) 6 (2) 4

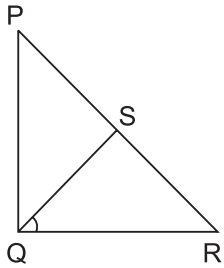
(3) 8 (4) 7

30. Two angles measure $(30-a)°$ and $(35+2a)°$. If each one is the supplement of the other, then the value of a is:

(1) 25° (2) 150°

(3) 30° (4) 115°

31. In a Δ PQR, right angled at Q, PQ = 24 cm and QR = 7 cm, S is the mid point of PR. Then RS is:



(1) 3.5 cm (2) 12 cm

(3) 25 cm (4) 12.5 cm

32. Find the remainder when y^3+y^2-2y+5 is divided by $y-5$.

(1) –145 (2) 135

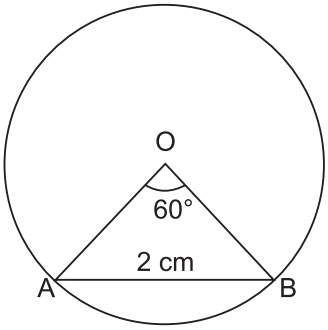
(3) –135 (4) 145

33. A coin is tossed 100 times and head appears 64 times. The probability of getting a tail is

(1) 19/25 (2) 0

(3) 9/25 (4) 1

34. What is the diameter of the following circle with centre O?



(1) 2 cm (2) 3 cm

(3) 4 cm (4) none of this

35. If $x=\frac{\sqrt{3}+\sqrt{2}}{\sqrt{3}-\sqrt{2}}$ and $y=\frac{\sqrt{3}-\sqrt{2}}{\sqrt{3}+\sqrt{2}}$ then find the value of x^2+y^2.

(1) 32 (2) 98

(3) 40 (4) 0

36. The mean of 40 items is 35 and if each item is multiplied by 'a' then the new mean will be:

(1) $35a$ (2) $35+a$

(3) 40 (4) $40+a$

37. Determine the remainder when x^4-3x^2+2x-5 is divided by $x-2$.

(1) 13

(2) 1

(3) 3

(4) 9

38. The mean of five numbers is 30. If one number is excluded, their mean becomes 28. What is the excluded number?

(1) 38

(2) 35

(3) 33

(4) 36

39. Diameter of the Earth is four times (approximately) the diameter of the Moon then the ratio of the surface area is:

(1) 4 : 1

(2) 8 : 1

(3) 16 : 1

(4) 64 : 1

40. Which line is parallel to $y = x - 2$?

(1) $y = 2x + 1$

(2) $2y = 2x - 6$

(3) $2y = x + 7$

(4) $y = 3x + 1$

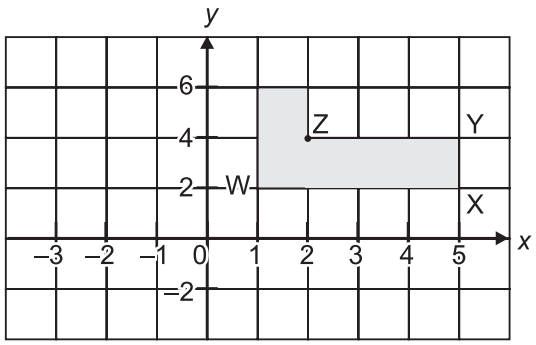
INTERACTIVE SECTION

41. Find the area of the triangular park whose sides are of the length 120 m, 80 m and 50 m.

(1) 375 (2) $375\sqrt{15}$

(3) $375\sqrt{5}$ (4) $375\sqrt{3}$

42. In the adjoining diagram, the area of the shaded figure is _____.



(1) 24 cm^2 (2) 18 cm^2

(3) 10 cm^2 (4) 20 cm^2

43. The mean of 100 observations is 50. If one of the observation which was 50 is replaced by 150 then what will be the resulting mean?

(1) 60 (2) 55

(3) 58 (4) 51

44. If $x + y + z = 10$ and $x^2 + y^2 + z^2 = 40$. Find $xy + yz + zx$

(1) 25 (2) 30

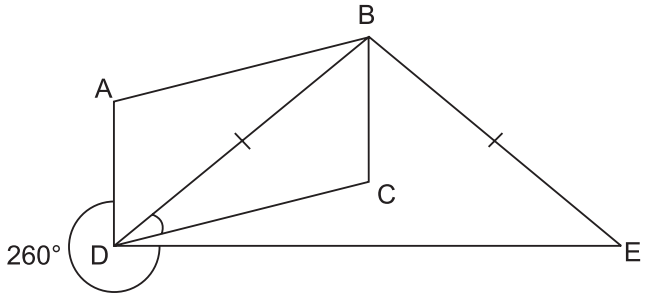
(3) 35 (4) 40

45. If $2^x = 4^y = 8^z$ and $\left(\frac{1}{2x} + \frac{1}{4y} + \frac{1}{6z}\right) = \frac{24}{7}$, then the value of z is

(1) 7/16 (2) 7/32

(3) 7/48 (4) 7/64

46. In the given figure, ABCD is a rectangle. BD = BE, $\angle BED = 40°$ and $\angle EDA = 260°$. Find $\angle CDB$.



(1) 25° (2) 30°

(3) 40° (4) 45°

47. How many dimensions does a surface has?

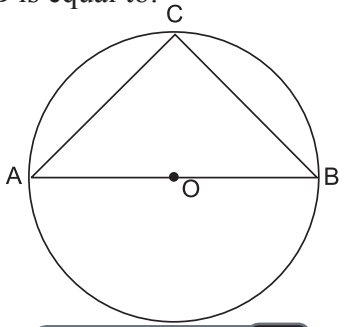
(1) One

(2) Two

(3) Three

(4) Four

48. In the given figure, if AOB is a diameter of the circle and AC = BC, then $\angle CAB$ is equal to:



(1) 30°

(2) 60°

(3) 90°

(4) 45°

49. In a mathematics test given to 15 students, the following mark (out of 100) are recorded:

41, 39, 48, 52, 46, 62, 54, 40, 96, 52, 98, 40, 42, 52, 60. Find the mean, median and mode of this data.

(1) 54.5, 40, 39 (2) 54.8, 52, 52

(3) 54.8, 40, 52 (4) 54.8, 52,42

50. If $a + b + c = 0$, then $x^{a^2b^{-1}c^{-1}}\, x^{a^{-1}b^2c^{-1}}\, x^{a^{-1}b^{-1}c^2} =$ _____

(1) $x^{a^2b^2c^2}$ (2) $x^{1/a^1b^2c^2}$

(3) $x^{a^{1/2}}$ (4) x^2

51. A wall of length 10 m was to be built across an open ground. The height of the wall is 4 m and thickness of the wall is 24 cm. If the wall is to be built up with bricks whose dimensions are 24 cm × 10 cm × 8 cm, how many bricks would be required?

(1) 5000 (2) 4000

(3) 3000 (4) 6000

52. The taxi charges in a city comprise of a fixed charge, together with charges of the distance covered. For a journey of 16 km, the charges paid are ₹156 and for a journey of 24 km, the charge paid are ₹204. What will a person have to pay for travelling a distance of 30 km?

(1) ₹236 (2) ₹240

(3) ₹248 (4) ₹252

53. A well with 10 m inside diameter is dug 14 m deep. Earth taken out of it is spread all around it to make an embankment of height $4\frac{2}{3}$. Find the width of the embankment.

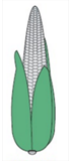
(1) 4.3 m

(2) 4 m

(3) 5 m

(4) 6 m

54. A corn cob, shaped somewhat like a cone, has the radius of its broadest end as 2.1cm and length (height) as 20 cm. If each 1sq cm of the surface of the cob carries an average of four grains, find how many grains you would find on the entire cob.



(1) 531

(2) 431

(3) 541

(4) 521

55. A die is rolled 10,500 times. The frequency of each outcome is shown in the table. What is the empirical probability of the outcomes of multiples of 3?

Outcome	Frequency
	1675
	1725
	1642
	1768
	1873
	1817

(1) 1153/3500

(2) 1153/3459

(3) 1153/10500

(4) 3459/10500

56. A juice seller in a marriage party has a cylindrical vessel with base radius 25 cm and height 40 cm full of juice. He gives the same in small glasses of radius 5 cm and height 10 cm. How many oranges are required for the bigger vessel to fill it completely, if to fill one small glass two oranges are required?

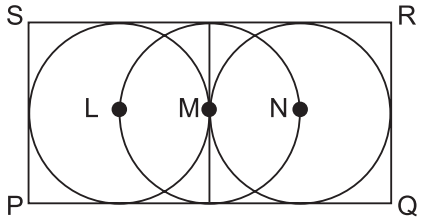
(1) 100

(2) 400

(3) 300

(4) 200

57. In the adjoining figure, circles with centres at L, M and N each have a radius of 2 units and are placed as shown here. If PQRS is the smallest rectangle that will enclose the 3 circles, what is the area of PQRS?



(1) 12 sq.units

(2) 32 sq.units

(3) 8 sq.units

(4) 16 sq.units

58. A recent survey found that the ages of workers in a factory is distributed as follows:

Age (in years)	Number of workers
20 – 29	38
30 – 39	27
40 – 49	86
50 – 59	46
60 and above	3

If a person is selected at random, find the probability that the person is 40 years or more.

(1) 43/100

(2) 23/100

(3) 27/40

(4) 27/200

59. Mr. Saxena has a rectangular plot of land ABCD which he decided to donate to his society for the organization of fitness campaign like yoga, meditation etc. the co-ordinates of three vertices of plot are A(–2, –5), B(6,–5) and C(6,–1). What is the area of the plot?

(1) 32 sq.units

(2) 36 sq.units

(c) 48 sq.units

(4) 16 sq.units

60. Meena wants to decorate her Christmas tree. She wants to place the tree on a wooden box covered with coloured paper with a picture of Santa Claus on it (as shown in figure below).

She must know the exact quantity of paper to buy for this purpose. If the box has length, breadth and height as 80 cm, 40 cm and 20 cm respectively. How many square sheets of paper of side 40 cm would she require?

(1) 9

(2) 7

(3) 8

(4) 10

END OF THE EXAM