ORANGE GLOBAL OLYMPIAD

MATHEMATICS

GRADE 9

School Level Examination

DO NOT OPEN THIS BOOKLET UNTIL INSTRUCTED TO DO SO

* All questions are compulsory.

* Read the instructions on the **ANSWER SHEET** and fill in your **NAME, CLASS and OTHER INFORMATION**.

To mark your choice of answer by darkening the circles in the Answer Sheet, use an **HB Pencil** only.

* You **MUST** record your answers on the **ANSWER SHEET**.

* There are 50 **MULTIPLE CHOICE QUESTIONS**. Use the information provided to choose the **BEST** answer among the four possible options.

On your **ANSWER SHEET** fill in the oval that matches your answer.

* Marks are **NOT** deducted for incorrect answers.

* Return the **Answer Sheet** to the invigilator at the end of the examination.

* Write your Roll No. on the Question Paper too and take it home for future reference.

* You are **NOT** allowed to use a calculator.

You may use a ruler and spare paper for rough work.

Section - A

(This section contains 10 multiple choice questions. Each question has four choices (A), (B), (C) and (D), out of which only ONE is correct).

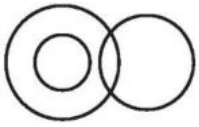
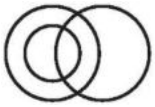
1. If the letters in the word BRAKES are arranged as they appear in the English Alphabet, then the position of how many letters will remain unchanged?

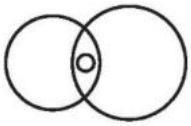
   (A) 1 (B) 2

   (C) 3 (D) 4

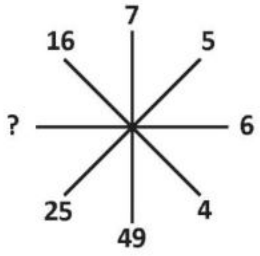
2. Which one of the diagrams given below represents the relationship among the following three groups of items?

   Engineers, Females, Wives

   (A)  (B) 

   (C)  (D) 

3. Which number will replace the question mark?



   (A) 6 (B) 36

   (C) 11 (D) 25

4. If WORK is coded as 4-12-9-16, then WOMAN will be coded as _____.

   (A) 4-12-14-26-13 (B) 12-4-16-13-11

   (C) 4-12-16-14-13 (D) 26-12-13-1-14

5. From his house, Ramesh went 20 km to the north. Then he turns west and covered 25 km. Then he turned south and covered 10 km. Finally turning to east, he covered 30 km. In which direction is he from his house?

   (A) North-West (B) North-East

   (C) South-West (D) South-East

6. Arrange the following in a meaningful order:

   1. Doctor
   2. Fever

3. Medicine
4. Medical shop

(A) 2, 4, 3, 1 (B) 4, 3, 2, 1

(C) 2, 1, 4, 3 (D) 3, 4, 1, 2

7. What should come in the place of question mark (?) in the following letter series?

BE GJ LO QT ?

(A) UZ (B) VY

(C) VZ (D) UY

8. P is the mother of Q and daughter of R. S is the daughter of Q and sister of T. How is P related to T?

(A) Aunt (B) Neice

(C) Maternal grandmother (D) None of these

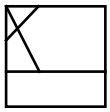
9. Find the odd one out.

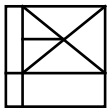
(A) 4-36 (B) 7-56

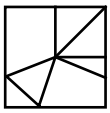
(C) 8-49 (D) 11-66

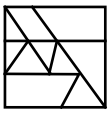
10. Select the figure in which figure A is exactly embedded as one of its part.

Figure A

(A) 

(B) 

(C) 

(D) 

Section - B

(This section contains 25 multiple choice questions. Each question has four choices (A), (B), (C) and (D), out of which only ONE is correct).

11. Given $8a^3 - b^3 - 4ax + 2bx$. When it is factorised, one of its factors is _____.

(A) $(3a - b)$ (B) $(2a - b)$

(C) $(a + 3b)$ (D) $(2a + b)$

12. A parallelogram and a rectangle are on the same base and between the same parallels. Their areas are equal. Then, _____.

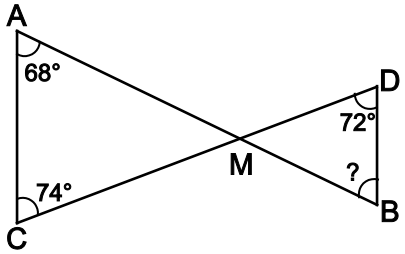
(A) Perimeter (rectangle) < perimeter (parallelogram)

(B) Perimeter (rectangle) = perimeter (parallelogram)

(C) Perimeter (rectangle) > perimeter (parallelogram)

(D) Depends on the angle of parallelogram

13. Find ∠MBD in the figure alongside, if AC || BD.



(A) 60° (B) 68°

(C) 70° (D) 74°

14. Polynomial for factors $(x – 2)(x + 2)(x – 13)$ is _____.

(A) $x^3 – 13x^2 – 4x + 52$ (B) $x^3 – 13x^2 + 4x + 52$

(C) $x^3 + 13x^2 – 4x + 52$ (D) $x^3 + 13x^2 + 4x + 52$

15. The graph of the linear equation $4x + 3y = 12$ cuts the y-axis at the point.

(A) (3, 0) (B) (0, 4)

(C) (4, 0) (D) (0, 3)

16. The range of the data: 6, 14, 20, 16, 8, 10, 25, 40, 18, 21 and 2 is _____ .

(A) 34 (B) 38

(C) 40 (D) 23

17. Which criteria cannot conclude when two given triangles are congruent to each other?

(A) SAS congruence (B) ASA congruence

(C) SSS congruence (D) AAA congruence

18. A and B are two points on a circle and $m(\overset{\frown}{AB}) = 260°$. The angle subtended by arc AB at a point on the circle may be.

(A) 40° (B) 50°

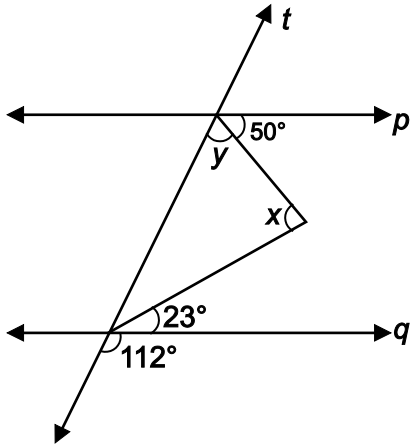
(C) 55° (D) 60°

19. The perpendicular distance of a point P from x-axis is 9 units along the negative direction of the y-axis, then the ordinate of P is _____.

(A) 9 (B) –9

(C) ±9 (D) None of these

20. In the given figure, $p||q$ and t is a transversal.



Then the values of *x* and *y* are _____.

(A) $x = 83°, y = 72°$ (B) $x = 70°, y = 45°$

(C) $x = 62°, y = 73°$ (D) $x = 73°, y = 62°$

21. The radii of two cylinders are in the ratio 1 : 3 and their height are in the ratio 3 : 5. The ratio of their volume in _____.

(A) 1 : 3 (B) 3 : 5

(C) 1 : 15 (D) 3 : 25

22. The complementary angle of an angle is one-fifth of itself. Then the angle of its complement are _____.

(A) 75°, 15° (B) 80°, 10°

(C) 55°, 35° (D) 72°, 18°

23. Which one of the following is NOT irrational?

(A) $3+\sqrt{13}$ (B) $\sqrt{13}+13$

(C) $\sqrt{3+13}$ (D) $\sqrt{3}+\sqrt{13}$

24. PQRS is a trapezium in which PQ || RS. If ar(ΔPQR) = 42 m^2 and PQ = 12 m, then height of ΔPQS is

(A) 8 (B) 7

(C) 12 (D) 4

25. ABCD is a parallelogram. The bisector of ∠A bisects BC at E. Then _____.

(A) AD = 2AB (B) AB = 2AD

(C) $AB = \frac{1}{3}AD$ (D) $AD = \frac{1}{3}AB$

26. If $x - 1$ is a zero of the polynomial $x^3 + 5x^2 - px + 4$, then the value of p is

(A) –10 (B) 2

(C) 10 (D) –2

27. A bag contains 10 green marbles and some blue marbles. If the probability of drawing a blue marble is thrice that of a green marble, find the number of blue marbles in the bag.

(A) 3 (B) 10

(C) 13 (D) 30

28. If $p = 1+\sqrt{2}$, then the value of $p^2 + \frac{1}{p^2}$ is _____.

(A) 4 (B) 6

(C) 8 (D) 10

29. The sum of length, breadth and depth of a cuboid is 21 cm and its diagonal is 11 cm. It's surface area is _____.

(A) 230 cm^2 (B) 441 cm^2

(C) 560 cm^2 (D) 320 cm^2

30. The coordinates of the origin are _____.

(A) (0, 1) (B) (1, 0)

(C) (0, 0) (D) (1, 1)

31. In ΔABC, AC > AB and AD is the bisector of $\angle A$, then $\angle ADC$ _____ $\angle ADB$.

(A) > (B) <

(C) = (D) ≥

32. In a parallelogram PQRS, PQ = 14 cm and altitude corresponding to PQ is 6 cm. If PS is 12 cm, then the length of altitude corresponding to PS is _____.

(A) 6 (B) 7

(C) 8 (D) 10

33. Which of the following numbers represent the recurring decimal number?

(A) $\frac{1}{4}$ (B) $\frac{7}{8}$

(C) $\frac{2}{5}$ (D) $\frac{2}{7}$

34. (0, –8) is a solution of the equation $3x + ky = -48$, then the value of k is _____.

(A) –6 (B) $\frac{-51}{8}$

(C) 6 (D) $\frac{-45}{8}$

35. A cumulative frequency distribution is given below:

Marks	below 45	below 60	below 75	below 90	below 105	below 120
No. of Students	0	8	23	48	85	116

The frequency of class interval 90-105 is _____.

(A) 25 (B) 37

(C) 48 (D) 85

Section - C

(This section contains 15 multiple choice questions. Each question has four choices (A), (B), (C) and (D), out of which TWO are correct).

36. If $x = \frac{1}{3-2\sqrt{2}}$ and $y = 3 - 2\sqrt{2}$, then

(A) $x = \frac{1}{y}$ (B) $x - y = 6$

(C) $x + y = 6$ (D) $y = \frac{1}{x} - 1$

37. The ordinate of a point is positive in _____.

(A) quadrant I (B) quadrant II

(C) quadrant III (D) quadrant IV

38. A solid cylinder has total surface area 462 cm². It's curved surface area is one-third of its total surface area. Then, its _____.

(A) Radius is 9 cm (B) Radius is 7 cm

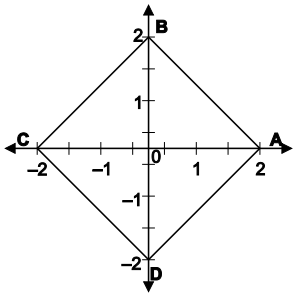
(C) Height is $\frac{7}{2}$ cm (D) Height is $\frac{9}{2}$ cm

39. To construct a triangle whose perimeter is 12 cm, and two angles are 50° and 80°, angles measuring are need to be constructed.

(A) 25° (B) 40°

(C) 50° (D) 80°

40. Lines which are parallel to the line, $x + y = 0$ are _____.



(A) $x + y = 2$ (B) $-x - y = 2$

(C) $x - y = 2$ (D) $-x + y = 2$

41. If the distance between the points $(3, k)$ and $(4, 1)$ is $\sqrt{17}$, then the value of k is _____.

(A) 3 (B) –3

(C) 5 (D) –5

42. Irrational numbers between $\sqrt{3}$ and $\sqrt{5}$ are _____.

(A) $15^{\frac{1}{2}}$ (B) $15^{\frac{1}{4}}$

(C) $3^{\frac{1}{4}} \times 15^{\frac{1}{2}}$ (D) $3^{\frac{1}{4}} \times 15^{\frac{1}{4}}$

43. If three coins are tossed simultaneously, then the probability of getting at least two heads is _____.

(A) $\frac{8}{9}$ (B) $\frac{3}{4}$

(C) $\frac{1}{2}$ (D) $\frac{4}{8}$

44. In a ΔABC, ∠ABC = ∠ACB, and the bisectors of ∠ABC and ∠ACB intersect each other at O, such that ∠BOC = 120°. Then, _____.

(A) ∠B = 120° (B) ∠A = 90°

(C) ∠A = ∠B = 60° (D) ∠B = ∠C = 60°

45. If the mean of 15 observations is 30 and that of another 20 observations is 23, then the mean of 35 observations is _____.

(A) 53 (B) 26

(C) $\frac{130}{5}$ (D) $\frac{265}{5}$

46. The graph of line $x - 7 = 0$ is a line _____.

(A) Such that the point (7, –3) lies on it

(B) Parallel to *y*-axis at a distance of 7 units to the right of *y*-axis

(C) Parallel to *y*-axis at a distance of 7 units to the left of *y*-axis

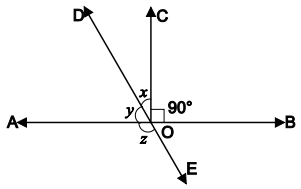
(D) Parallel to *x*-axis at a distance of 7 units above *x*-axis

47. Set of integers is a subset of _____.

(A) Set of Natural Numbers (B) Set of Rational Numbers

(C) Set of Odd Numbers (D) Set of Real Numbers

48. In the given figure, lines AB and DE intersect at O and $\angle COB = 90°$.
Also $x : y = 2 : 3$, then _____.



(A) $x = 36°$ (B) $y = 54°$

(C) $z = 130°$ (D) $x + z = 172°$

49. In a parallelogram LMNO, $\angle L = (5x - 30)°$, $\angle M = (y + 45)°$ and $\angle N = (x + 10)°$, then _____.

(A) $x = 5°$ (B) $x = 10°$

(C) $y = 115°$ (D) $y = 55°$

50. Given two cubes of total surface area 150 cm^2 each, combined volume of these two cubes is _____.

(A) 250 cm^3 (B) 300 cm^3

(C) Sum of volumes (D) Sum of surface areas

Acknowledgement

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