ORANGE GLOBAL OLYMPIAD

School Level Examination
SLE 2023

GRADE 8

MATHEMATICS

Subject Code: 2 0 1

Total Questions: 40

Time: 1 hour

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 a **BLUE/BLACK BALLPAN** only.
- You **MUST** record your answers on the **ANSWER SHEET** only.
- There are **40 MULTIPLE CHOICE QUESTIONS**. Use the information provided to choose the **BEST** possible answer among the four options. On your **ANSWER SHEET** fill in the circle that matches your answer.
- Marks are **NOT** deducted for incorrect answers.
- Return the **ANSWER SHEET** to the invigilator at the end of the examination.
- You are **NOT** allowed to use a calculator. You may use a ruler and spare paper for rough work.

This question paper contains a total of 40 questions divided into three sections - A, B and C.

Read the instructions carefully before attempting these questions.

Section A (Logical Reasoning)

1. P, Q and R are three cities on a map. P is North of Q and ∠PQR is 45° in clockwise direction. In what direction is R from Q?

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

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

2. What values of p and q will make the given square a magic square with sum of each column row and diagonal as 81?

	q	30
31		
	p	28

   (A) $p = 26$ $q = 25$ (B) $p = 29$ $q = 25$

   (C) $p = 29$ $q = 24$ (D) $p = 25$ $q = 29$

3. Which description shows the relationship between the value of missing term and n (its position) in the following sequence?

Position	1	2	3	4	5	n
Value of the term	2	6	10	14	18	?

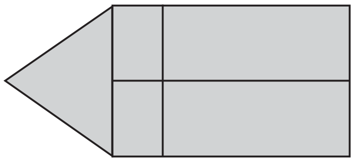
   (A) Add 3 to n.

   (B) Multiply n by 2 and then subtract 3.

   (C) Multiply n by 4 and then subtract 2.

   (D) Multiply n by 3 and then add 3.

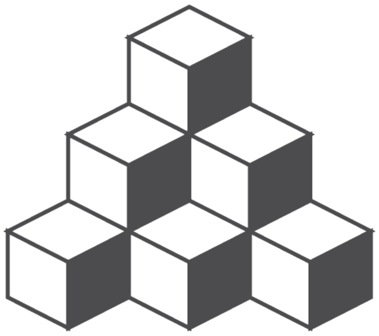
4. How many rectangles can be formed from the following figure?



   (A) 8 (B) 9

   (C) 11 (D) 10

5. Count the number of cubes, in the given figure.



   (A) 8 (B) 10

   (C) 12 (D) 14

6. Select the related letters/words/numbers from the given alternatives.

   216 : 6 : : 729 : ___?____

   (A) 10 (B) 8

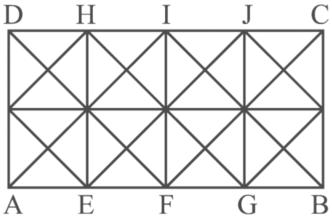
   (C) 9 (D) 7

7. Choose the odd one out.

   (A) Silver (B) Gold

   (C) Ruby (D) Bronze

8. ABCD is a rectangle with AB = 2AD. F, E, G are the mid-points of AB, AF and FB respectively. The number of squares in the given figure is



   (A) 10 (B) 20

   (C) 21 (D) 24

Section B (Subject Specific)

9. What is the multiplicative inverse of $3\frac{1}{8}$?

   (A) $\frac{-25}{8}$ (B) $\frac{8}{25}$

   (C) $\frac{25}{8}$ (D) $\frac{-8}{25}$

10. When a certain number P is divided by 4 and added to 9, the result is equal to 4P subtracted from 5. Find the value of P.

   (A) $\frac{16}{17}$ (B) $\frac{-16}{17}$

   (C) $\frac{17}{16}$ (D) $\frac{-17}{16}$

11. In a square ABCD, the diagonals meet at point O. What kind of triangle is △ AOB, formed within the square?

   (A) An isosceles right triangle (B) An equilateral triangle

   (C) An isosceles triangle but not right triangle (D) A scalene right triangle

12. Shalini wants to construct a square PQRS in which PQ = $(2x + 3)$ cm and RQ = $(3x - 5)$ cm. What value of x should she take so that she can construct the square correctly?

   (A) 3 (B) 4

   (C) 6 (D) 8

13. The set of all possible outcomes of a random experiment is called __________.

(A) Sample space
(B) Probability
(C) Trials
(D) Experiment

14. The number of digits in the square root of 15241383936 is __________.

(A) 5
(B) 6
(C) 7
(D) 8

15. If one number of a Pythagorean triplet is 6, then which of the following will form the correct Pythagorean triplet?

(A) (4, 5, 6)
(B) (5, 6, 7)
(C) (6, 7, 8)
(D) (6, 8, 10)

16. Simple interest at $y\%$ for y years will be ₹y on a sum of __________.

(A) ₹y
(B) ₹$100y$
(C) ₹$\left(\frac{100}{y}\right)$
(D) ₹$\left(\frac{100}{y^2}\right)$

17. Which of the following is an incorrect statement about cubes and cube roots?

(A) The cube of 0.6 is 0.216.
(B) Let x and y be natural numbers. If x divides y, then x^3 divides y^3.
(C) +4 and –4 are both the possible cube roots of 64.
(D) A perfect cube does not end with even number of zeros.

18. If the number of faces and vertices in a solid are 7 and 10 respectively, then the number of edges is ________.

(A) 17
(B) 15
(C) 19
(D) 13

19. If 11 toffees are bought for ₹10 and 10 of them are sold for ₹11, then find the approximate gain%.

(A) 10%
(B) 11%
(C) 17%
(D) 21%

20. What are the numeric values of A, B and C for which $\begin{array}{r} A\ B \\ \times\ \ 5 \\ \hline C\ A\ B \\ \hline \end{array}$, where A, B and C are digits?

(A) A = 5, B = 0, C = 2
(B) A = 2, B = 0, C = 5
(C) A = 4, B = 5, C = 2
(D) None of these

21. The factors of $p(x)$ are $(a + 2)$ and $(a + 6)$, then find the $p(x)$ with these factors.

(A) $a^2 + 8a + 12$
(B) $a^2 - 4a + 12$
(C) $a^2 + 4a - 12$
(D) $a^2 - 4a - 12$

22. The value of $\left[\left\{\left(-\frac{4}{9}\right)^{2}\right\}^{0}\right]^{\frac{1}{2}}$ is equal to __________.

(A) $\frac{4}{9}$ (B) $-\frac{4}{9}$

(C) $\frac{9}{4}$ (D) 1

23. The teacher is explaining how to build a prism using straws and balls of clay. Can you guess how many straws are required to build a pentagonal prism?

(A) 13 (B) 15

(C) 18 (D) 21

24. The simplest form of $\frac{(x^2 + 6x + 8)\,(x + 4)}{(x + 2)\,(x + 4)}$ is __________.

(A) $x + 4$ (B) $2x + 4$

(C) $x + 2$ (D) 1

25. The parallel sides of a trapezium are in the ratio 4:7 and the perpendicular distance between them is 18 cm. If the area of the trapezium is 1485 cm^2, then what will be the measurement of longer of the two parallel sides?

(A) 45 cm (B) 60 cm

(C) 90 cm (D) 105 cm

26. If *x*-coordinate exceeds by 1 to 3 times of *y*-coordinate, then coordinate is __________.

(A) (7, 2) (B) (7, 3)

(C) (2, 7) (D) (2, 6)

27. Two trains approach each other at 60km/hr and 54km/hr from two places 798 km apart. If the two trains start at the same time from opposite directions, after how many hours will they cross each other?

(A) 5 hours (B) 6 hours

(C) 7 hours (D) 8 hours

28. Which of the following numbers is the smallest multiple of all the numbers from 1 to 9?

(A) 5,040 (B) 1,225

(C) 1440 (D) 2,520

Instruction: Q. 29 to 33 are two-key based questions having four options A, B, C and D out of which TWO are correct.

29. The mid value of a class interval is called __________ and the difference of upper limit and lower limit is called __________.

(A) Class mark (B) Frequency

(C) Class size (D) Range

30. Hardy-Ramanujan number is the number which can be expressed as the sum of two cubes in two different ways. Which are the Hardy-Ramanujan numbers in the following numbers?

(A) 1729 (B) 1728

(C) 4104 (D) 4096

31. If $4x^2 + 9y^2 = 40$ and $xy = 2$, then the value of $2x + 3y$ is __________.

(A) 8 (B) 16

(C) –8 (D) –16

32. The average age of three boys is 25 years and their ages are in the ratio 3 : 5 : 7. The age of the youngest boy is __________ and the eldest boy is __________.

(A) 9 years (B) 15 years

(C) 18 years (D) 35 years

33. If one side and one diagonal of a rhombus are 5 cm and 8 cm respectively, then its area in and perimeter are _________ and _________.

(A) 48 cm (B) 40 cm

(C) 24 cm^2 (D) 20 cm

Section C (Competency Enhancement)

34. Varun has decided to build a well with embankment of width 0.70 m around it, on an empty plot of 25 m long and 15 m wide. He is discussing with his father about building a well of depth 5.6 m and radius 2.8 m, and using the remaining plot to make a garden. If he finally decides to dig a well, then what will be the amount of mud taken out from the well?

(A) 123.2 m^3 (B) 137.984 m^3

(C) 133.2 m^2 (D) 98.56 m^2

35. If mass of the earth is (5.97×10^{24}) kg and mass of the moon is (7.35×10^{22}) kg, then total mass of the earth and the moon in the scientific rotation is __________.

(A) 6.0435×10^{24} kg (B) 604.35×10^{-24} kg

(C) 6.235×10^{22} kg (D) None of these

In the given histogram, the number of students and the period of time for which they watched the TV is given. Based on reading of the histogram, answer the questions 36 and 37.

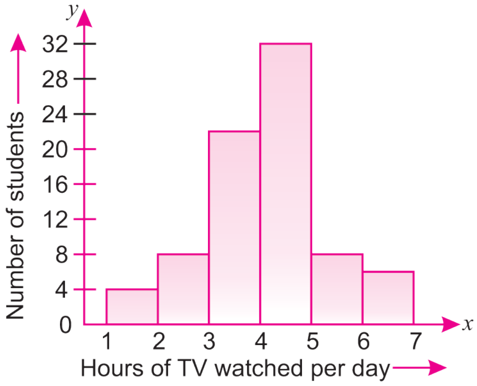
36. The hours for which maximum number of students watched TV is _________.

(A) 1 - 2 hours

(B) 2 - 3 hours

(C) 4 - 5 hours

(D) 3 - 4 hours



37. The number of students who spent more than 5 hours in watching TV is ________.

(A) 11
(B) 14
(C) 12
(D) 13

38. If, and there is no carry on addition, then the value of A is ________.

$$\begin{array}{rccc} & 1 & A & B \\ + & C & C & A \\ \hline & 6 & 9 & 7 \\ \hline \end{array}$$

(A) 2
(B) 3
(C) 4
(D) 5

39. Which of the following steps is incorrect while constructing a rhombus PQRS, given that PR = 8 cm and QS = 6 cm?

Step (i): Draw PR = 8 cm

Step (ii): Draw AB, the perpendicular of PR. AB intersects PR at point 0.

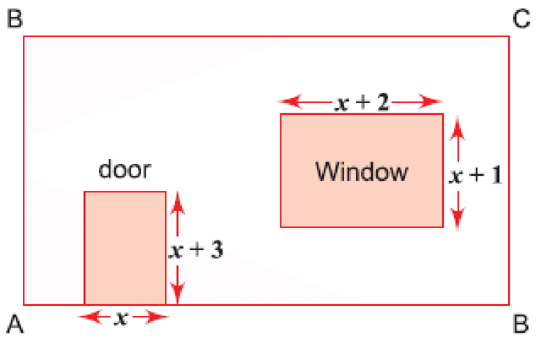
Step (iii): With O as centre and radius equal to 3 cm, draw an arc cutting OA at S.

Step (iv): With O as centre and radius equal to 3 cm, draw another arc cutting OB at Q.

Step (v): Join PQ, QR, RS, and SP.

(A) Step 2 only
(B) Step 3 only
(C) Step 4 only
(D) Both step 2 and step 5

40. The following figure shows a wall of area $(3x^2 + 10x + 8)$ cm^2 having a window and a door. If area of the window and the door is excluded then remaining area of the wall is __________.



(A) $(x + 6)$ cm
(B) $(2x + 6)$ cm
(C) $(x - 6)$ cm
(D) $(x^2 + 4x + 6)$ cm^2

GRADE
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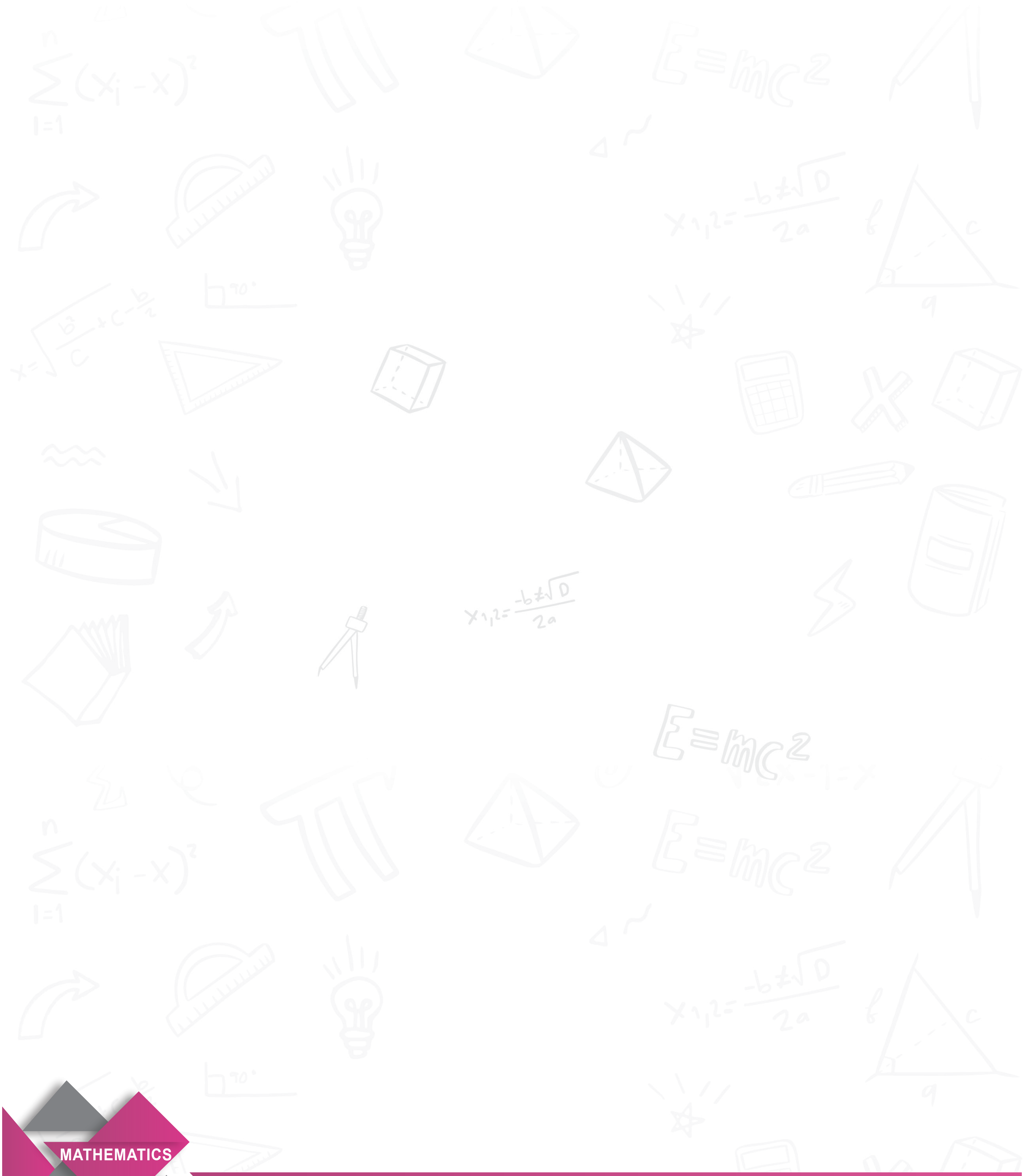

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