

**Half-Yearly Examination - (2026-27)**  
**SUBJECT – MATHEMATICS (SET - 2)**

TIME – 2½ Hours

Class- VIII

M.M – 60

*General Instructions: All questions are compulsory. This question paper contains 29 questions divided into Sections A, B, C, and D.*

**SECTION – A (1 x 12 = 12M)**

Q1. Which of the following is a cube number?

(A) 64 (B) 50 (C) 125 (Wait, both 64 and 125 are cubes. Let's make options: (A) 50, (B) 75, (C) 216, (D) 300)

Q2. The standard (scientific) form of 0.000458 is:

(A)  $4.58 \times 10^{-4}$  (B)  $4.58 \times 10^4$  (C)  $45.8 \times 10^{-5}$  (D)  $4.58 \times 10^{-3}$

Q3. A colony of fungi triples every 2 hours. If there are 5 fungi initially, how many will be there after 6 hours?

(A) 135 (B) 405 (C) 45 (D) 1215

Q4. Which ancient system introduced the base-10 positional number system with symbols?

(A) Roman numeral system (B) Hindu-Arabic numeral system (C) Mayan numeral system (D) Egyptian numeral system

Q5. If the speed of light is approximately  $3 \times 10^8$  meters per second, how far does light travel in  $4 \times 10^2$  seconds?

(A)  $1.2 \times 10^{11}$  m (B)  $7 \times 10^{10}$  m (C)  $1.2 \times 10^{10}$  m (D)  $3.4 \times 10^6$  m

Q6. Which of the following pairs of angles form a linear pair?

(A)  $30^\circ$  and  $60^\circ$  (B)  $70^\circ$  and  $110^\circ$  (C)  $45^\circ$  and  $45^\circ$  (D)  $120^\circ$  and  $80^\circ$

Q7. What is the LCM of 24 and 36?

(A) 12 (B) 48 (C) 72 (D) 144

Q8. Which property is reflected in the equation:  $a \times (b + c) = (a \times b) + (a \times c)$ ?

(A) Associative property (B) Commutative property (C) Distributive property (D) Closure property

Q9. If  $x = 5$ ,  $y = 3$ , and  $z = 2$ , find the value of  $x^2 - (y \times z)$ :

(A) 19 (B) 25 (C) 13 (D) 22

Q10. A number is divisible by 11 if:

(A) The sum of digits is a multiple of 11.

(B) The difference between the sum of digits at odd places and even places is 0 or a multiple of 11.

- (C) Its last digit is 1.
- (D) The last two digits are divisible by 11.

Q11. Assertion (A): The cube of an even number is always even.

Reason (R): When an even number is multiplied by an even number three times, the product is even.

- (A) Both A and R are true and R is the correct explanation of A.
- (B) Both A and R are true but R is not the correct explanation of A.
- (C) Assertion A is true but Reason R is false.
- (D) Assertion A is false but Reason R is true.

Q12. Assertion (A): A parallelogram is a quadrilateral with opposite sides parallel and equal.

Reason (R): Opposite angles of a parallelogram are supplementary.

- (A) Both A and R are true and R is the correct explanation of A.
- (B) Both A and R are true but R is not the correct explanation of A.
- (C) Assertion A is true but Reason R is false.
- (D) Assertion A is false but Reason R is true.

### **SECTION – B (2 x 7 = 14M)**

Q13. Find the side length of a square playground whose area is  $729 \text{ m}^2$ .

Q14. Evaluate and write in standard numerical form:

- (i)  $4.5 \times 10^4$     (ii)  $7.25 \times 10^{-3}$

Q15. Convert the decimal number 84 into binary system representation.

Q16. Represent the number 1494 in Roman numerals.

Q17. Three angles of a quadrilateral measure  $75^\circ$ ,  $90^\circ$ , and  $115^\circ$ . Find the measure of the fourth angle.

Q18. Check whether the number 9,41,316 is divisible by 11 without actual division.

Q19. Expand the algebraic product:  $(2x - 3)(x + 5)$

### **SECTION – C (3 x 6 = 18M)**

Q20. Use suitable properties to calculate:  $457 \times 92 + 457 \times 8$ .

Q21. [Case Study] In a school election, candidate A receives  $3x^2 + 5x - 7$  votes, candidate B receives  $2x^2 - 4x + 12$  votes, and total valid votes cast is  $10x^2 - 2x + 5$ . Find the number of votes received by candidate C.

Q22. [Figure Question / Geometry] In a parallelogram ABCD, the bisectors of adjacent angles  $\angle A$  and  $\angle B$  meet at point P. What is the measure of  $\angle APB$ ? (Include figure representation in description / setup)

Q23. Simplify using exponent laws and express with positive exponents:  $(2^{-3} \times 3^{-2})/6^{-4}$ .

Q24. A box contains 5 different colored shirts, 4 trousers, and 3 pairs of shoes. How many unique outfits (shirt + trouser + shoes) can be formed?

Q25. Find the smallest number by which 392 must be multiplied so that the product is a perfect cube. Also, find the cube root of that perfect cube.

**SECTION – D (4 x 4 = 16M)**

Q26. [Case Study / Growth Problem] A culture starts with 1,000 bacteria. The population quadruples every hour.

- (i) How many bacteria will there be after 3 hours?
- (ii) On which hour will the population exceed 2,50,000?
- (iii) If the growth rate becomes double every half-hour instead, find the count after 1.5 hours.

Q27. Use the laws of exponents to simplify and evaluate:

$$[(3^3)^4 \times (5^2)^3] / (15^6)$$

Q28. Compute using algebraic identities:

- (i)  $(105)^2$  using  $(a + b)^2$
- (ii)  $98 \times 102$  using  $(a + b)(a - b)$

Q29. [Geometry Figure Case] Construct a rectangle PQRS whose adjacent sides are 6 cm and 4.5 cm. Write the step-by-step construction procedure.