CHAPTER TEST: NUMBER SYSTEMS

Mathematics | Class IX | (2026/NUMSYS/09/HOTS/001)

Time: 1.5 Hours **Max. Marks: 35**

General Instructions:

- All questions are compulsory.
- Section A contains 8 MCQs of 1 mark each.
- Section B contains 4 Very Short Answer questions of 2 marks each.
- Section C contains 3 Short Answer questions of 3 marks each.
- Section D contains 2 Long Answer/HOTS questions of 5 marks each.
- Use of calculators is not permitted.

Section A: Multiple Choice Questions (1 Mark Each)

1. Which of the following is an irrational number?
   (a) $\sqrt{225}$
   (b) 0.3796
   (c) 7.478478...
   (d) 1.1010010001...

2. The value of $\left[(64)^{\frac{1}{2}}\right]^{\frac{1}{3}}$ is:
   (a) 2
   (b) 4
   (c) 8
   (d) 1

3. Every rational number is:
   (a) A natural number
   (b) An integer
   (c) A real number
   (d) A whole number

4. Between two rational numbers, there are:
   (a) Exactly one rational number
   (b) Infinitely many rational numbers
   (c) Many irrational numbers only
   (d) No rational number

5. The product of any two irrational numbers is:

(a) Always an irrational number
(b) Always a rational number
(c) Always an integer
(d) Sometimes rational, sometimes irrational

6. The decimal representation of the rational number $\frac{33}{2^2 \times 5}$ is:
   (a) Terminating
   (b) Non-terminating repeating
   (c) Non-terminating non-repeating
   (d) None of these

7. The value of $\sqrt[4]{\sqrt[3]{2^2}}$ is:
   (a) $2^{-\frac{1}{6}}$
   (b) 2^{-6}
   (c) $2^{\frac{1}{6}}$
   (d) 2^6

8. If $x = 2 + \sqrt{3}$, then the value of $x + \frac{1}{x}$ is:
   (a) 4
   (b) $2\sqrt{3}$
   (c) -4
   (d) $2 - \sqrt{3}$

Section B: Very Short Answer Questions (2 Marks Each)

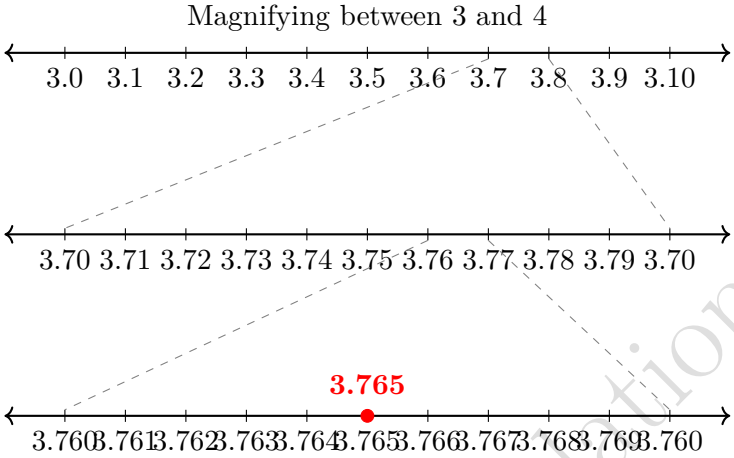
1. Express $0.2\overline{35}$ in the form $\frac{p}{q}$, where p and q are integers and $q \neq 0$.
2. Simplify: $\left(\frac{81}{16}\right)^{-\frac{3}{4}} \times \left[\left(\frac{25}{9}\right)^{-\frac{3}{2}} \div \left(\frac{5}{2}\right)^{-3}\right]$.
3. Rationalize the denominator of: $\frac{1}{\sqrt{7}-\sqrt{6}}$.
4. Find two irrational numbers between 0.1 and 0.12.

Section C: Short Answer Questions (3 Marks Each)

1. If a and b are rational numbers and $\frac{3+\sqrt{7}}{3-\sqrt{7}} = a + b\sqrt{7}$, find the values of a and b.
2. Represent $\sqrt{3}$ on the number line using a geometric construction.
3. Simplify the following expression: $\frac{1}{1+\sqrt{2}} + \frac{1}{\sqrt{2}+\sqrt{3}} + \frac{1}{\sqrt{3}+\sqrt{4}}$.

Section D: Long Answer / HOTS Questions (5 Marks Each)

1. If $x = \frac{\sqrt{3}+\sqrt{2}}{\sqrt{3}-\sqrt{2}}$ and $y = \frac{\sqrt{3}-\sqrt{2}}{\sqrt{3}+\sqrt{2}}$, find the value of $x^2 + y^2 + xy$.
2. Visualize the representation of 3.765 on the number line using successive magnification.



End of Question Paper