

THE WORLD OF NUMBERS

Multiple Choice Questions

- Q 1. Which of the following lists contains only irrational numbers?
- (a) 0, -3, 3.14 (b) $\frac{22}{7}$, 0.0141414, $\sqrt{3}$
(c) $\sqrt{2}$, $\sqrt{3}$, $\sqrt{4}$ (d) $\sqrt{5}$, π
- Q2. Which of the following numbers can be written as a non-terminating but recurring decimal?
- (a) $\frac{43}{8}$ (b) 9
(c) $\frac{5}{12}$ (d) $\sqrt{6}$
- Q 3. The value of 1.999 ... in the form $\frac{p}{q}$, where p and q are integers and $q \neq 0$, is:
- (a) $\frac{19}{10}$ (b) $\frac{1999}{1000}$
(c) 2 (d) $\frac{1}{9}$
- Q 4. Which of the following rational numbers is equivalent to a decimal that terminates?
- (a) $\frac{1}{3}$ (b) $\frac{3}{8}$
(c) $\frac{5}{6}$ (d) $\frac{8}{9}$
- Q 5. If the number $x = 1.242424 \dots$ is expressed in the simplest form $\frac{p}{q}$, then $p + q$ equals:
- (a) 41 (b) 53
(c) 72 (d) 74
- Q6. Which of the following is equivalent to $0.5\overline{782}$?
- (a) $\frac{5770}{9990}$ (b) $\frac{5772}{9990}$
(c) $\frac{5777}{9990}$ (d) $\frac{5782}{9990}$
- Q 7. The simplest form of $1.\overline{6}$ is:
- (a) $\frac{5}{3}$ (b) $\frac{7}{4}$
(c) $\frac{11}{9}$ (d) $\frac{15}{13}$



- Q8. If $x = 0.\overline{473}$, then $1000x$ is equal to:
 (a) $473.\overline{473}$ (b) 0.473
 (c) $0.473473473\overline{473}$ (d) $0.4737473\overline{473}$
- Q 9. Decimal expansion of $\frac{874}{999}$ is:
 (a) $0.\overline{874}$ (b) $0.874\overline{4}$
 (c) $8.\overline{74}$ (d) $8.\overline{74}$
- Q 10. $\frac{p}{q}$ form of $0.000\overline{2}$ is equal to:
 (a) $\frac{1}{4500}$ (b) $\frac{1}{3200}$
 (c) $\frac{1}{3600}$ (d) $\frac{1}{9000}$

Assertion-Reason Based Questions

The following questions are Assertion and Reason based questions. Two statements are given, one labelled as Assertion (A) and the other is labelled as Reason (R). Select the correct answer to these questions from the codes (a), (b), (c) and (d) as given below.

- (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) A is true, but R is false.
 (d) A is false, but R is true.

- Q11. Assertion (A) : π is a rational number.
 Reason (R) : π cannot be expressed as the ratio of two integers.
- Q 12. Assertion (A) : The number $0.090909 \dots$ is rational.
 Reason (R) : Every terminating or repeating decimal expansion represents a rational number.
- Q 13. Assertion (A) : The decimal representation of $\frac{3}{8}$ is terminating.
 Reason (R) : If the denominator of a rational number is of the form $2^m \times 5^n$, where m, n are non-negative integers, then its decimal representation is terminating.

Very Short Answer Questions

- Q 14. Determine, whether the following number is rational or irrational: $\sqrt{225}$.
- Q 15. Shyam draws the spiral of irrational numbers below on a paper.



Q 25. Express each of the following as a fraction in simplest form :

(i) $0.\overline{245}$

(ii) $0.\overline{001}$

(iii) $3.\overline{14}$

Q26. Express the following as a fraction in simplest form.

(i) $0.\overline{0001}$

(ii) $0.\overline{57}$

Q27. Without performing division, determine whether the decimal expansion of $\frac{18}{125}$ is terminating or non-terminating. If it terminates, state the number of decimal places.

Q 28. A rational number in its lowest form has denominator $2^3 \times 5$. How many decimal places will its decimal expansion have? Explain your answer.

Long Answer Questions

Q 29. Locate $\sqrt{5}$ and $\sqrt{37}$ on the number line.

Q30. Express $0.6 + 0.\overline{7} + 0.4\overline{7}$ in the form $\frac{p}{q}$, where p and q are integers and $q \neq 0$.

Case Study Based Questions

Q31. In a school, one day the Maths teacher told the students of class IX about the number system. She drew a number line and explained them that the number line represents various types of numbers on it. Rational and irrational numbers can be represented on the number line.



A number is called a rational number if it can be written in the form of $\frac{p}{q}$ and a number is called an irrational number if it cannot be written in the form of $\frac{p}{q}$, where p and q are integers and $q \neq 0$.

Based on the above information, answer the following questions:

- (i) Find a rational number between 2 and 3.
- (ii) Find an irrational number between 2.45 and 5.23.

OR

- (ii) Find a rational number between 2.125 and 2.126.
- (iii) Express $1.\bar{3}$ in the form $\frac{p}{q}$, where p and q are integers, $q \neq 0$.

ANSWER KEY

- | | | | | | |
|---------|--------------|----------------------|--------|--------|--------|
| 1. (d) | 2.(c) | 3.(c) | 4.(b) | 5.(d) | 6.(c) |
| 7. (a) | 8.(a) | 9.(a) | 10.(a) | 11.(d) | 12.(a) |
| 13. (a) | 14. Rational | 15. $\sqrt{5}$ units | | | |
16. (a) Rational
(b) Rational
(c) Rational
(d) Irrational
17. Yes
18. 0.5020020002 ..., 0.5313313331 ..., 0.54544544454444 ...
19. Infinitely many, 10 rational numbers: 3.51, 3.512, 3.52, 3.53, 3.54, 3.55, 3.56, 3.57, 3.58, 3.59
22. (i) 0.0002 and 0.000300003000003 (Answer may vary)
(ii) 2.2 and 2.101001000 ... (Answer may vary)
(iii) 6.3753 and 6.3753530053000 ... (Answer may vary)
23. (i) 0.36 , terminating
(ii) $0.\overline{09}$ Non-terminating and repeating
(iii) $0.\overline{230769}$ Non-terminating and repeating
(iv) $0.\overline{18}$ Non-terminating and repeating
(v) 0.8225 Terminating
24. (i) $\frac{23}{90}$
(ii) $\frac{8}{2475}$
(iii) $\frac{133}{990}$



25. (i) $\frac{27}{110}$ (ii) $\frac{1}{999}$ (iii) $\frac{311}{99}$

26. (i) $\frac{1}{9999}$ (ii) $\frac{19}{33}$

27. Terminating, 3

28. 3

30. $\frac{167}{90}$

31. (i) 2.5 (ii) 3.47892367 (Answer may vary) OR 2.125555 ... (Answer may vary) (iii) $\frac{4}{3}$

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