

KERALA HIGH COURT
OFFICE ATTENDANT EXAM

Numerical Ability

Number System

Key Concepts • Shortcuts • 25 Practice Questions • Answer Key with Solutions

1. Key Concepts

Term	Meaning
Natural numbers	1, 2, 3, ... (counting numbers)
Whole numbers	0, 1, 2, 3, ... (natural numbers and zero)
Integers	..., -2, -1, 0, 1, 2, ...
Prime numbers	Exactly two factors (1 and itself). 2 is the only even prime. Primes below 20: 2, 3, 5, 7, 11, 13, 17, 19 (8 primes). 1 is neither prime nor composite.
Composite numbers	More than two factors (4, 6, 8, 9, ...)
Co-primes	Pair of numbers with HCF = 1 (e.g., 8 and 15)
Even / Odd	Even: divisible by 2. Odd: not divisible by 2. Sum of first n odd numbers = n^2 .

2. Divisibility Rules

Divisible by	Rule
2	Last digit is 0, 2, 4, 6 or 8
3	Sum of digits divisible by 3
4	Last two digits divisible by 4
5	Last digit is 0 or 5
6	Divisible by both 2 and 3
8	Last three digits divisible by 8
9	Sum of digits divisible by 9
10	Last digit is 0
11	(Sum of digits at odd places) - (sum of digits at even places) = 0 or a multiple of 11

3. Important Formulas & Shortcuts

- Sum of first n natural numbers = $\frac{n(n+1)}{2}$.
- Sum of first n even numbers = $n(n+1)$; sum of first n odd numbers = n^2 .
- HCF x LCM = Product of the two numbers.**
- Dividend = (Divisor x Quotient) + Remainder.
- If sum = S and difference = D: larger = $(S+D)/2$, smaller = $(S-D)/2$.
- BODMAS order: Brackets, Orders (powers/roots), Division, Multiplication, Addition, Subtraction.
- Number of factors: if $N = a^p \times b^q$ (a, b prime), factors = $(p+1)(q+1)$.
- Remainder trick: to find the remainder of a power, find a power that leaves remainder 1 and use the cycle.
- Smallest number to add to N to make it divisible by d = $d - (\text{remainder of } N / d)$.
- Largest n-digit number divisible by d = (largest n-digit number) - (its remainder when divided by d).

4. Unit Digit Cycles

Last digit of base	Cycle of unit digits	Cycle length
2	2, 4, 8, 6	4
3	3, 9, 7, 1	4

Last digit of base	Cycle of unit digits	Cycle length
4	4, 6	2
7	7, 9, 3, 1	4
8	8, 4, 2, 6	4
9	9, 1	2
0, 1, 5, 6	Always same digit	1

Method: divide the power by the cycle length; the remainder tells the position in the cycle (remainder 0 means the last digit of the cycle).

5. Squares & Cubes to Memorise

Type	Values
Squares	$11^2=121$, $12^2=144$, $13^2=169$, $14^2=196$, $15^2=225$, $16^2=256$, $17^2=289$, $18^2=324$, $19^2=361$, $20^2=400$, $25^2=625$
Cubes	$2^3=8$, $3^3=27$, $4^3=64$, $5^3=125$, $6^3=216$, $7^3=343$, $8^3=512$, $9^3=729$, $10^3=1000$

6. Practice Questions (25)

Q1. Which of the following is a prime number?

- (a) 61
- (b) 51
- (c) 57
- (d) 91

Q2. What is the sum of the first 20 natural numbers?

- (a) 190
- (b) 200
- (c) 210
- (d) 220

Q3. The smallest 4-digit number divisible by 12 is:

- (a) 1000
- (b) 1002
- (c) 1008
- (d) 1012

Q4. The HCF of 36 and 84 is:

- (a) 6
- (b) 12
- (c) 18
- (d) 24

Q5. The LCM of 12, 15 and 20 is:

- (a) 30
- (b) 60
- (c) 120
- (d) 180

Q6. The unit digit of 3^{45} is:

- (a) 1
- (b) 3
- (c) 7
- (d) 9

Q7. The remainder when 2^{10} is divided by 7 is:

- (a) 2
- (b) 1
- (c) 4
- (d) 6

Q8. Which number is divisible by 9?

- (a) 4562
- (b) 4565
- (c) 4568
- (d) 4563

Q9. The smallest number to be added to 1000 to make it divisible by 7 is:

- (a) 2
- (b) 3
- (c) 1
- (d) 4

Q10. Simplify: $15 + 12 / 3 \times 2 - 4$

- (a) 17
- (b) 19
- (c) 21
- (d) 23

Q11. The square root of 7056 is:

- (a) 74
- (b) 76
- (c) 84
- (d) 86

Q12. The cube root of 4913 is:

- (a) 15
- (b) 16
- (c) 19
- (d) 17

Q13. Which is the greatest fraction?

- (a) $3/4$
- (b) $5/6$
- (c) $2/3$
- (d) $7/8$

Q14. The decimal 0.36 expressed as a fraction in simplest form:

- (a) $18/25$
- (b) $9/25$
- (c) $7/20$
- (d) $36/10$

Q15. The product of two numbers is 1620 and their HCF is 9. Their LCM is:

- (a) 120
- (b) 160
- (c) 180
- (d) 200

Q16. The sum of two numbers is 45 and their difference is 9. The larger number is:

- (a) 24
- (b) 27
- (c) 29
- (d) 36

Q17. How many prime numbers are there between 1 and 20?

- (a) 6
- (b) 7
- (c) 9
- (d) 8

Q18. The largest 3-digit number divisible by 11 is:

- (a) 988
- (b) 990
- (c) 999
- (d) 979

Q19. The average of the first 5 odd numbers is:

- (a) 4
- (b) 6
- (c) 7
- (d) 5

Q20. Find the missing number: 1, 4, 9, 16, ?, 36

- (a) 20
- (b) 24
- (c) 25
- (d) 30

Q21. The smallest number divisible by 2, 3, 4, 5 and 6 is:

- (a) 30
- (b) 90
- (c) 60
- (d) 120

Q22. Which of the following is a perfect square?

- (a) 1150
- (b) 1156
- (c) 1154
- (d) 1158

Q23. Simplify: $(-7) + 12 - (-5)$

- (a) 0
- (b) 14
- (c) 10
- (d) 24

Q24. A number leaves remainder 3 when divided by 5. The remainder when twice the number is divided by 5 is:

- (a) 1
- (b) 2
- (c) 3
- (d) 4

Q25. The number of factors of 36 is:

- (a) 6
- (b) 8
- (c) 12
- (d) 9

7. Answer Key

1-a | 2-c | 3-c | 4-b | 5-b | 6-b | 7-a | 8-d | 9-c | 10-b | 11-c | 12-d | 13-d | 14-b | 15-c | 16-b | 17-d | 18-b | 19-d | 20-c | 21-c | 22-b | 23-c | 24-a | 25-d

8. Solutions

Q1. (a) 61 - $51 = 3 \times 17$, $57 = 3 \times 19$, $91 = 7 \times 13$. Only 61 has no factor other than 1 and itself.

Q2. (c) 210 - $n(n+1)/2 = 20 \times 21 / 2 = 210$.

Q3. (c) 1008 - $1000 / 12$ leaves remainder 4, so add $12 - 4 = 8$: 1008.

Q4. (b) 12 - $36 = 2^2 \times 3^2$; $84 = 2^2 \times 3 \times 7$. HCF = $2^2 \times 3 = 12$.

Q5. (b) 60 - $12 = 2^2 \times 3$; $15 = 3 \times 5$; $20 = 2^2 \times 5$. LCM = $2^2 \times 3 \times 5 = 60$.

Q6. (b) 3 - Cycle of 3 is 3, 9, 7, 1 (length 4). $45 / 4$ leaves remainder 1, so the first in the cycle: 3.

Q7. (a) 2 - $2^3 = 8$ leaves remainder 1. $2^{10} = (2^3)^3 \times 2$, remainder = $1 \times 2 = 2$.

Q8. (d) 4563 - Digit sum of 4563 = $4+5+6+3 = 18$ (divisible by 9). The others have sums 17, 20, 23.

Q9. (c) 1 - $1000 / 7 = 142$ remainder 6. Add $7 - 6 = 1$ ($1001 = 7 \times 143$).

Q10. (b) 19 - BODMAS: $12/3 = 4$; $4 \times 2 = 8$; $15 + 8 - 4 = 19$.

Q11. (c) 84 - $84 \times 84 = 7056$.

Q12. (d) 17 - Last digit 3 means cube root ends in 7. $17 \times 17 \times 17 = 4913$.

Q13. (d) 7/8 - Decimals: 0.75, 0.833, 0.667, 0.875. Greatest = 7/8.

Q14. (b) 9/25 - $0.36 = 36/100 = 9/25$.

Q15. (c) 180 - LCM = Product / HCF = $1620 / 9 = 180$.

Q16. (b) 27 - Larger = $(45 + 9)/2 = 27$.

Q17. (d) 8 - 2, 3, 5, 7, 11, 13, 17, 19 = 8 primes.

Q18. (b) 990 - 999 / 11 leaves remainder 9. $999 - 9 = 990$ (11×90).

Q19. (d) 5 - $1+3+5+7+9 = 25$; $25 / 5 = 5$.

Q20. (c) 25 - These are squares of 1, 2, 3, 4, 5, 6. Missing = $5^2 = 25$.

Q21. (c) 60 - LCM of 2, 3, 4, 5, 6 = 60.

Q22. (b) 1156 - $34 \times 34 = 1156$.

Q23. (c) 10 - $-7 + 12 + 5 = 10$.

Q24. (a) 1 - Remainder = $2 \times 3 = 6$, and $6 / 5$ leaves remainder 1.

Q25. (d) 9 - $36 = 2^2 \times 3^2$; factors = $(2+1)(2+1) = 9$.

Tip: In the exam, first try eliminating options using divisibility rules and unit digits; it saves time.