1 CHAPTER

NUMBER SYSTEM, LCM AND HCF

1. The value of (1 +0.1 +0.11 +0.111) is

(a) 1.321 (b) 1.211

(c) 1.111 (d) 1.331

[RRB JE 2014 GREEN SHIFT]

2. When a number is divided by 5, it gives remainder 3. What is the remainder when square of that number is divided by 5?

(a) 9 (b) 3

(c) 4 (d) 1

[RRB JE 2014 GREEN SHIFT]

3. $\sqrt{10}$ = 3.1623(approx.). What is the approx, value of $\frac{1}{\sqrt{10}}$?

(a) 0.333 (b) 0.3162

(c) 0.3221 (d) 0.3437

[RRB JE 2014 GREEN SHIFT]

4. Find the value of $(2744)^{1/3}$:

(a) 24 (b) 14

(c) 34 (d) 16

[RRB JE 2014 RED SHIFT]

5. Find the L.C.M. of 148 and 185.

(a) 680 (b) 740

(c) 2960 (d) 3700

[RRB JE 2014 RED SHIFT]

6. If $2^{2n-1} = \frac{1}{8^{n-3}}$, then the value of 'n' is :

(a) 3 (b) 2

(c) 0 (d) –2

[RRB JE 2014 RED SHIFT]

7. What is the largest possible length of a scale that can be used to measure exactly the lengths 3 m, 5 m 10 cm and 12 m 90 cm ?

(a) 10 cm (b) 20 cm

(c) 25 cm (d) 30 cm

[RRB JE 2014 YELLOW SHIFT]

8. After measuring 120 metres of a rope, it was discovered that the metre rod was 3 cm longer. The true length of the rope measured is :

(a) 116 m 40 cm (b) 121m 20 cm

(c) 123 m (d) 123 m 60 cm

[RRB JE 2014 YELLOW SHIFT]

9. Solve $\sqrt[3]{0.000064}$ = ?

(a) 0.4 (b) 0.04

(c) 0.004 (d) 0.0004

[RRB JE 2014 YELLOW SHIFT]

10. The HCF of two numbers is 6 and their LCM is 72. If one number is 24, the other number is

(a) 12 (b) 18

(c) 36 (d) 72

[RRB JE 2015 26th AUG 1st SHIFT]

11. The largest number which divides by 72 and 125, leaving remainders 7 and 8 respectively is

(a) 13 (b) 56

(c) 65 (d) 900

[RRB JE 2015 26th AUG 1st SHIFT]

12. The HCF of two numbers is 12 and their LCM is 72. If one number is 36, the other number is

(a) 12 (b) 24

(c) 36 (d) 48

[RRB JE 2015 26th AUG 2nd SHIFT]

13. The largest number which divides 81 and 108, leaving remainders 6 and 3 respectively is

(a) 9 (b) 15

(c) 18 (d) 515

[RRB JE 2015 26th AUG 2nd SHIFT]

14. The HCF of two numbers is 15 and their LCM is 270. If one number is 45, the other number is

(a) 18 (b) 90

(c) 81 (d) 675

[RRB JE 2015 26th AUG 3rd SHIFT]

15. The largest number which divides 247 and 319, leaving remainders 7 and 4 respectively is

(a) 15 (b) 30

(c) 45 (d) 56

[RRB JE 2015 26th AUG 3rd SHIFT]

16. The HCF of two numbers is 15 and their LCM is 210. If one number is 105, the other number is

(a) 15 (b) 30

(c) 45 (d) 75

[RRB JE 2015 27th AUG 1st SHIFT]

17. The least number which when divided by 10,15 and 18, leaving remainder 5 in each case is

(a) 85 (b) 90

(c) 95 (d) 105

[RRB JE 2015 27th AUG 1st SHIFT]

18. The HCF of two numbers is 12 and their LCM is 72. If one number is 48, the other number is

(a) 18 (b) 24

(c) 36 (d) Data is inconsistent

[RRB JE 2015 27th AUG 2nd SHIFT]

19. The largest number which divides by 125 and 187, leaving remainders 5 and 7 respectively is

(a) 60 (b) 30

(c) 20 (d) 10

[RRB JE 2015 27th AUG 2nd SHIFT]

20. The HC'F and LCM of 16 and 25 are respectively

(a) 0.400 (b) 1,400

(c) 1,25 (d) 16,25

[RRB JE 2015 27th AUG 3rd SHIFT]

21. The least number which when divided by 8 and 12 leaving remainder 5 in each case is

(a) 19 (b) 29

(c) 91 (d) 101

[RRB JE 2015 27th AUG 3rd SHIFT]

22. The HCF and LCM of 9 and 17 are

(a) 0,153 (b) 1,153

(c) 1,9 (d) 1,17

[RRB JE 2015 28th AUG 1st SHIFT]

23. The least number which when divided by 15 and 20 leaving remainder 9 in each case is

(a) 60 (b) 65

(c) 69 (d) 309

[RRB JE 2015 28th AUG 1st SHIFT]

24. The HCF and LCM of 24 and 36 are respectively

(a) 12,36 (b) 24,72

(c) 12,72 (d) 36,72

[RRB JE 2015 28th AUG 2nd SHIFT]

25. The least number which when divided by 15 and 18 leaving remainder 6 in each case is

(a) 84 (b) 96

(c) 264 (d) 276

[RRB JE 2015 28th AUG 2nd SHIFT]

26. The HCF and LCM of first two prime numbers is

(a) 1, 2 (b) 1, 3

(c) 2, 3 (d) 1, 6

[RRB JE 2015 28th AUG 3rd SHIFT]

27. The least number which when divided by 10 and 16 leaving remainder 6 in each case is

(a) 36 (b) 86

(c) 156 (d) 164

[RRB JE 2015 28th AUG 3rd SHIFT]

28. Let x be the greatest number that divides 55, 127 and 175 leaving the same remainder in each case. The remainder in each case is

(a) 3 (b) 5

(c) 7 (d) 9

[RRB JE 2015 29th AUG 1st SHIFT]

29. LCM of the numbers a, b, c, and d, where $a = 2^5 \times 11^3 \times 13^4$, $b = 2^4 \times 11^4 \times 13^5$, $c = 2^4 \times 11^5 \times 13^3$ and $d = 2^3 \times 11^4 \times 13^4$ is

(a) $(2 \times 11 \times 13)^5$ (b) $2^5 \times 11^4 \times 13^5$

(c) $(2 \times 11 \times 13)^4$ (d) $2^4 \times 11^5 \times 13^4$

[RRB JE 2015 29th AUG 1st SHIFT]

30. Let x be the greatest number that divides 952, 1165 and 1591 leaving the same remainder in each case. The sum of digits of x is

(a) 4 (b) 5

(c) 6 (d) 7

[RRB JE 2015 29th AUG 2nd SHIFT]

31. Let $x = 5^4 \times 7^3 \times 19^3$, $y = 5^3 \times 7^4 \times 19^3$, $z = 5^5 \times 7^5 \times 19^3$ and $w = 5^3 \times 7^5 \times 19^4$. The LCM of x, y, z and w is

(a) $5^5 \times 7^4 \times 19^4$ (b) $(35)^5 \times 19^4$

(c) $(35)^4 \times 19$ (d) $5^4 \times 7^5 \times 19^4$

[RRB JE 2015 29th AUG 2nd SHIFT]

32. Let x be the greatest number that divides 3739, 2270 and 6677 leaving the same remainder in each case. The sum of digits of x is

(a) 9 (b) 12

(c) 18 (d) 20

[RRB JE 2015 29th AUG 3rd SHIFT]

33. Let $a = 2^5 \times 7^4 \times (13)^5$, $b = 2^4 \times 7^5 \times (13)^4$, $c = 2^6 \times 7^3 \times (13)^4$ and $d = 2^7 \times 7^2 \times (13)^6$

Then LCM of a, b, c and d is

(a) $2^6 \times (91)^5$ (b) $52 \times (182)^5$

(c) $(13)^6 \times (14)^7$ (d) $5^2 \times (182)^4$

[RRB JE 2015 29th AUG 3rd SHIFT]

34. Is it possible to divide 1000 into two parts such that their HCF is 15

(a) Yes. it is possible

(b) No. it is sometimes possible

(c) Yes. it may be possible

(d) Never possible

[RRB JE 2015 30th AUG 3rd SHIFT]

35. The LCM of two prime numbers x and y (x > y) is 161. The value of 3y – x is

(a) –2 (b) –1

(c) 1 (d) 2

[RRB JE 2015 30th AUG 3rd SHIFT]

36. Let N be the largest number that will divide 1305. 4665 and 6905. leaving the same remainder in each case. Then sum of the digits in N is

(a) 4 (b) 5

(c) 6 (d) 8

[RRB JE 2015 16th SEP 3rd SHIFT]

37. If the sum of two numbers is 55 and the HCF and LCM of these numbers are 5 and 20 respectively, then the sum of the reciprocals of the numbers is equal to

(a) 55/601 (b) 601/55

(c) 11/120 (d) 120/11

[RRB JE 2015 16th SEP 3rd SHIFT]

38. The HCF of $(x^2 – 4)$, $(x^2 – 5x – 6)$ and $(x^2 + x – 6)$

(a) 1 (b) (x – 2)

(c) (x + 2) (d) $(x^2 + x – 6)$

[RRB JE 2015 16th SEP 3rd SHIFT]

39. If Polynomial $2x^3 + ax^2 + 3x – 5$ and $x^3 + x^2 – 2x + a$ are divided by (x – 2). the same remainder are obtained. Find the value of a

(a) 3 (b) –9

(c) –3 (d) –5

[RRB JE 2015 16th SEP 3rd SHIFT]

ANSWERS

1. (a)	**2.** (c)	**3.** (a)	**4.** (b)	**5.** (b)	**6.** (b)	**7.** (a)	**8.** (d)	**9.** (b)	**10.** (b)
11. (a)	**12.** (b)	**13.** (b)	**14.** (b)	**15.** (a)	**16.** (b)	**17.** (c)	**18.** (d)	**19.** (a)	**20.** (c)
21. (b)	**22.** (d)	**23.** (c)	**24.** (c)	**25.** (b)	**26.** (d)	**27.** (b)	**28.** (c)	**29.** (a)	**30.** (c)
31. (b)	**32.** (d)	**33.** (b)	**34.** (a)	**35.** (a)	**36.** (a)	**37.** (c)	**38.** (a)	**39.** (c)	

EXPLANATIONS

1. $1 + 0.1000 + 0.110 + 0.111 = 1.321$

2. Let the number be 8.
Thus, when $8^2 = 64$ will be divided by 5, then remainder will be 4.

3. $\frac{1}{3.1623}$ will be less than 0.3333.

4. 2744 is a multiple of 7.
Hence, the answer has to be 14.

5. $148 = 37 \times 4$ and $185 = 37 \times 5$
$\Rightarrow$LCM $= 37 \times 4 \times 5 = 740$

6. $2^{2n-1} = \frac{1}{3n-9}$
$\Rightarrow 2^{2n-1} \times 2^{3n-9} = 2^0$
$\Rightarrow 5n - 10 = 0$
$\Rightarrow n = \frac{10}{5} = 2$

7. Required scale has to be of length 10 cm because 10 cm is the shortest length in in given question.

8. Actual length has to be
$120m + (120 \times 3)$ cm $= 120$ m $+ 360$ cm
$\Rightarrow$ 123 m 60 cm.

9. $\sqrt[3]{0.000064} = \sqrt[3]{\frac{4}{100} \times \frac{4}{100} \times \frac{4}{100}} = .04$

10. We know that, $x \times y =$ LCM $\times$ HCF
(x, y are the two distinct numbers)
$\Rightarrow x \times 24 = 72 \times 6$
$\Rightarrow x = 18.$

11. In such a questions it is better to check the options. In this case 13 satisfies the given condition. Rest of the numbers are large enough to be eliminated easily.

12. set the number be x
$\Rightarrow \quad x \times 36 = 12 \times 72$
$\Rightarrow \quad x = 24$

13. Checking the options we get the correct answer as 15.

14. HCF $\times$ LCM = Product of numbers
$\Rightarrow$ other number $= \frac{15 \times 270}{45} = 90$

15. Numbers = 247, 319
$\therefore$ remainders = 7 & 4,
$\left.\begin{matrix} 247 - 7 = 240 \\ 319 - 4 = 315 \end{matrix}\right\}$ are divisible
HCF (240, 315) = 15

16. HCF $\times$LM = Product of numbers = a $\times$ b
$\Rightarrow$ other number $\Rightarrow b = \frac{15 \times 210}{105} = 30$

17. LCM (10, 15, 18) = 90
$\therefore$ 90 will be divisible by 10, 15 & 18
$\therefore$ for remainder 5, answer = 90 + 5 = 95

18. HCF $\times$LM = Product of numbers = a $\times$ b
$\Rightarrow b = \frac{12 \times 72}{48} = 18$
HCF (18, 48) $\neq$ 12
$\therefore$Data is inconsistent

19. Numbers = 125, 187
Remainders = 5 and 7
$\therefore$HCF (125 – 5, 187 – 7))
HCF (120, 180) = 60

20. LCM $(16_1 25) = 16 \times 25 = 400$
HCF $(16_1 25) = 1$

21. $N = 8k_1 + 5 = 12k_1 + 5$
$N =$ LCM $(8_1 12)k + 5 = 24\,k + 5$
Least Number $= 24 \times 1 + 5 = 29$

22. LM (9, 17) $= 9 \times 17 = 153$
HCF (9, 17) = 1

23. Number $= 15\,K_1 + 9 = 20\,K_2 + 9$
$=$ LCM (15, 20) K + 9 = 60K + 9
Least No. $60 \times 1 + 9 = 69$

24. HCF $(24_1 36) = 12$
LCM $(24_1 36) = 72$

25. Number $= 15\,k_1 + 6 = 18\,k_2 + 6$
$\Rightarrow$ Number = LCM $(15_1 18)\,k + 6 = 90\,k + 6$
Last Number $= 90 \times 1 + 6 = 96$

26. First 2 prime number = 2, 3
$\left.\begin{matrix} \text{HCF} = 1 \\ \text{LCM} = 6 \end{matrix}\right\}$

27. LCM (10,16)
$\therefore$ To leave remainder 6,
$= 80 + 6 = 86$

28. Numbers = 55, 127, 175
127 – 55 = 72
175 – 127 = 48
175 – 55 = 120
HCF (72, 48, 120) = 24
$\therefore$ Remainder of $\frac{55}{24} = 7$

29. LCM - $2^5 \times 11^5 \times 13^5 = (2 \times 11 \times 13)^5$

30. N = HCF of (1165-952), (1591-952), (1591-1165)

HCF of 213, 639, 426

= 213

Sum of digits = 2 + 1 + 3 = 6

31. $x = 5^4 \times 7^3 \times 19^3$

$y = 5^5 \times 7^4 \times 19^3$

$z = 5^5 \times 7^5 \times 19^3$

$w = 5^3 \times 7^5 \times 19^4$

LCM = $5^5 \times 7^5 \times 19^4 = (35)^5 \times 19^4$

32. N = HCF of (3739-2270), (6677 – 2270) and (6677 – 3739)

HCF of (1469, 4407 and 2938) = 1469

Sum of digits = 20.

33. $a = 2^5 \times 7^4 \times 13^5$, $b = 2^4 \times 7^5 \times 13^4$,

$c = 2^6 \times 7^3 \times 13^4$

$d = 2^7 \times 7^2 \times 13^6$

LCM = $2^7 \times 7^5 \times 13^6 = (182)^5 \times 52$.

34. If A + B = 1000 and A and B are multiples of 15.

Then 1000 would have to be multiple of 3 and 5.

But 1000 is not a multiple of 3.

$\therefore$ Not possible.

35. $161 = 23 \times 7$

$7 \times 3 - 23 = 21 - 23 = -2$.

36. Numbers : 1305, 4665, 6905

4665 – 1305 = 3360

6905 – 1665 = 2240

6905 – 1305 = 5600

N = HCF (3360, 2240, 5600) = 1120

$\therefore$ sum of digits = 1 + 1 + 2 = 4

37. Let numbers = a & b

sum of a & b

ab = HCF × LCM = 5 × 120

$\therefore \quad \frac{1}{a}+\frac{1}{b}=\frac{a+b}{ab} = \frac{55}{5\times 120}=\frac{11}{120}$

38. $x^2 - 4 = (x - 2)(x + 2\_$

$x^2 - 5x - 6 = (x + 1)(x - 6)$

$x^2 + x - 6 = (x - 2)(x + 3)$

$\therefore$ HCF = 1

39. When f(x) is divided by (x – a)

Remainder = f(a) [Remainder Theorem)

$\therefore$ for $2x^3 + ax^2 + 3x - 5$

$f(2) = 2 \times 8 + a \times 4 + 3 \times 2 - 5$

$= 17 + 4a$

similarly, for $x^3 + x^2 - 2x + a$

$f(2) = 8 + 4 - 2 \times 2 + a = 8 + a$

$\Rightarrow 17 + 4a = 8 + a$

$\Rightarrow a = -3$