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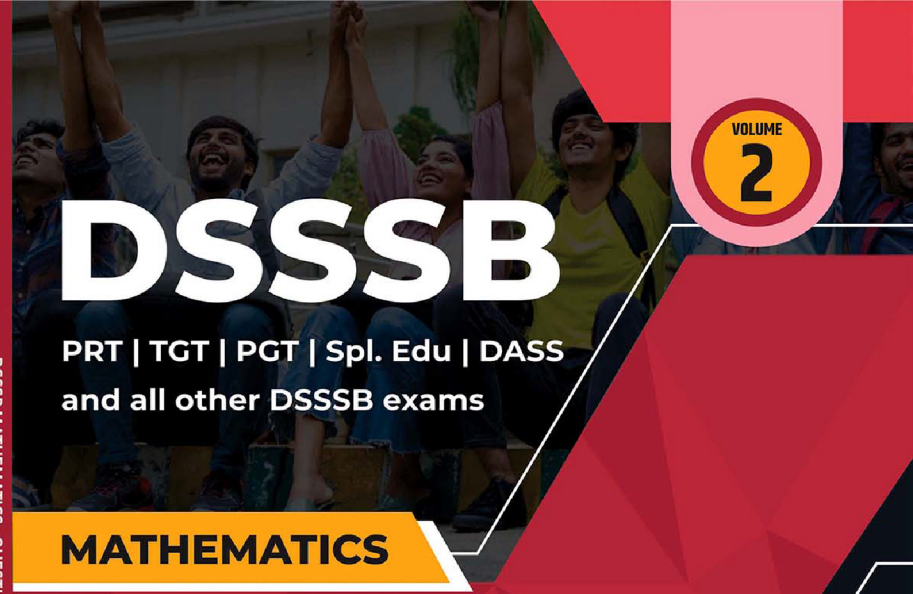

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Chapter 1

Number System

1. If a number Y587X is exactly divisible by 90, then what is the value of Y–X?
(A) 7 (B) 3
(C) 5 (D) 4
[DSSSB (PRT) 16-03-2022 (Shift-II)]

2. What is the digit at the unit place $(98)^{68} \times (55)^{62} \times (27)^{91}$?
(A) 0 (B) 6
(C) 2 (D) 5
[DSSSB (PRT) 16-03-2022 (Shift-III)]

3. If a number 537XY is exactly divisible by 90 then what is the value of (X + Y)?
(A) 8 (B) 5
(C) 9 (D) 3
[DSSSB (PRT) 16-03-2022 (Shift-III)]

4. What is the digit at the unit place $58^{96} \times 56^{25} \times 89^{28}$?
(A) 2 (B) 5
(C) 6 (D) 4
[DSSSB (PRT) 23-03-2022 (Shift-II)]

5. After solving $3^{53} - 6^{38} + 27^{56}$ tell the digit at the unit place of the obtained value.
(A) 4 (B) 2
(C) 8 (D) 6
[DSSSB (PRT) 15-11-2019 (Shift-II)]

6. If 98A89B is divisible by 48, then what is the value of A + B?
(A) 8 (B) 15
(C) 9 (D) 10
[DSSSB (PRT) 11-11-2019 (Shift-I)]

7. If $P(n) : 2.4^{2n+1} + 3^{3n+1}$ and for $n \in N$ which is divisible by λ. Then value of λ is:
(A) 11 (B) 5
(C) 7 (D) None of these
[DSSSB (PRT) 28-10-2017 (Shift-I)]

8. Find the sum of natural even numbers from 2 to 42.
(A) 462 (B) 426
(C) 642 (D) 624
[DSSSB (PRT) 28-12-2014]

9. A number $1a2b3c$ is exactly divisible by 11. What are the possible values for (a, b, c)?
(A) (4, 0, 2) (B) (4, 5, 3)
(C) (5, 2, 7) (D) (5, 3, 6)
[DSSSB TGT Natural Science (Female) 25-09-2021 (Shift-III)]

10. For what value of N, 72N is divisible by 16?
(A) 4 (B) 8
(C) 6 (D) 0
[DSSSB TGT Social Science (Male) 06-09-2021 (Shift-I)]

11. Find the sum of the digits of the smallest four digit number which is exactly divisible by 8, 10, 12, 18 and 24?
(A) 12 (B) 9
(C) 8 (D) 6
[DSSSB PGT Political Science (Male), 04-07-2021 (Shift-II)]

12. When a number is divisible by 308, then the remainder is 60. Find the remainder when the same number is divisible by 28.
(A) 8 (B) 4
(C) 14 (D) 30
[DSSSB PGT Sociology (Female), 25-06-2021 (Shift-I)]

13. For what value of M and N will 7M5285N be divisible by 8 and 9?
(A) (5, 3) (B) (9, 6)
(C) (3, 6) (D) (6, 6)

14. Two pencils, three books and four erasers cost ₹ 15. Three pencils, two books and one eraser cost ₹ 10. I bought 3 pencils, 3 books and 3 erasers. How much did I pay?
(A) ₹ 25 (B) ₹ 20
(C) ₹ 15 (D) ₹ 10
[DSSSB DASS (Grade-II), 24-07-2019 (Shift-III)]

15. The population of city A is 84,000, which decreases at the rate of 1,400 per year. Population of city B is 38,000 which increase at the rate of 900 per year. In how many years will the population of cities A and B be equal?
(A) 18 (B) 15
(C) 16 (D) 20
[DSSSB DASS (Grade-II), 23-07-2019 (Shift-II)]

16. Three co-prime numbers are such that the product of the first two is 527 and that of the last two is 1147. The sum of the three numbers is:
(A) 85 (B) 58
(C) 75 (D) 68
[DSSSB DASS (Grade-II), 22-07-2019 (Shift-II)]

17. Which of the following is closest to zero?
(A) $(0.9)^2$ (B) $1 - (0.9)^2$
(C) $(0.09)^2$ (D) 0.09
[DSSSB DASS (Grade-II), 19-07-2019 (Shift-I)]

18. $2.\overline{63}$ in the form of $\frac{p}{q}$ is equal to:
(A) $\frac{45}{33}$ (B) $\frac{67}{33}$
(C) $\frac{87}{33}$ (D) $\frac{68}{33}$
[DSSSB DASS (Grade-II), 18-07-2019 (Shift-III)]

19. A building has 2 elevators. X gets on one of them and Y on another. X takes the elevator from the 2nd floor which goes up at 15 floors a minute. Y takes the elevator from 107th floor which comes down at 20 floor a minute. At which floor do X and Y meet?
(A) 47 (B) 46
(C) 48 (D) 45
[DSSSB LDC, 25-08-2019 (Shift-I)]

20. Which of the following statements is/are correct?
I. 999999999 is divisible 7, 11 and 13.
II. 333333, is divisible by 7 and 11 but not by 13.
III. 444444, is divisibly be 7 and 13 but not by 11.
IV. 555555, is divisible by 7, 11 and 13.
(A) II, III (B) I
(C) I, IV (D) IV
[DSSSB LDC, 23-08-2019 (Shift-I)]

21. Which of the following statement(s) is/are correct?
I. (3/11) > 0.3
II. (7/8) > 0.86
(A) Both I and II (B) Neither I nor II
(C) Only II (D) Only I
[DSSSB LDC, 18-08-2019 (Shift-I)]

22. There are 3 types of rice. The amount of the rice are 703 kg, 851 kg and 333 kg respectively. The rice are packed such that

no two types of rice are mixed. If the size of packet is largest and all packets have same size, then what is the number of packets?

(A) 51 (B) 37

(C) 39 (D) 43

[DSSSB LDC, 18-08-2019 (Shift-III)]

23. A is a three digit smallest number which on dividing by 8 and 12 gives a remainder of 6 and 10 respectively. B is a two digit number greatest number which is divisible by 7 and 8 both. What is the value of A + B?

(A) 172 (B) 168

(C) 180 (D) 174

[DSSSB LDC, 17-08-2019 (Shift-III)]

24. A man sells 6 radios and 4 televisions for ₹ 18,480. If 14 radios and 2 televisions are sold for the same amount, the price of a television is:

(A) ₹ 1,848 (B) ₹ 840

(C) ₹ 1,680 (D) ₹ 3,360

[DSSSB Lab Technician, 20-10-2019]

25. Thrice a number is 24 more than one-third of it. The number is

(A) 8 (B) 9

(C) 12 (D) 15

[DSSSB Lab Technician, 20-10-2019]

26. 5 * 2 is a three digit number with * as a missing digit. If the number is divisible by 6, the missing digit is:

(A) 3 (B) 6

(C) 7 (D) 2

[DSSSB Grade- II Head Clerk Tier-II, 25-11-2018]

27. If n is any positive integer, then $(3^{4n} - 4^{3n})$ is always divisible by:

(A) 7 (B) 17

(C) 112 (D) 145

[DSSSB Grade- II Head Clerk Tier-II, 25-11-2018]

28. A factory produces x cars in a week. In how many days will it produce 60 cars?

(A) $\frac{60}{x}$ (B) $60x$

(C) $\frac{420}{x}$ (D) $\frac{x}{60}$

[DSSSB Grade-III, 24-09-2017]

29. A school has 378 girl students and 675 boy students. The school is divided into strictly boys or strictly girls of sections. All sections in the school have the same number of students. What is the number of sections in the school?

(A) 42 (B) 39

(C) 17 (D) None of these

[DSSSB DASS Grade-II Tier-I, 25-06-2017]

30. The greatest 5 digit number which is exactly divisible by 100 is:

(A) 99898 (B) 99800

(C) 99900 (D) 99999

[DSSSB Stenographer Grade-III, 11-06-2017]

31. What is the remainder when 7^{1287} is divided by 172?

(A) 170 (B) 171

(C) 172 (D) None of these

[DSSSB Lower Division Clerk, 30-07-2015]

32. If an amount of ₹ 5,86,700 is distributed equally amongst 25 persons, then how much would each person get?

(A) ₹ 37,420 (B) ₹ 19,562

(C) ₹ 2,54,876 (D) ₹ 23,468

[DSSSB Lower Division Clerk, 30-07-2015]

33. There are two examinations rooms A and B. If 10 students are sent from A to B, then the number of students in each room is the same. If 20 candidates are sent from B to A, then the number of students in A is double, the number of students in B. the number students in room A is :

(A) 20 (B) 100

(C) 120 (D) 200

[DSSSB Prashasnik Adhikari, 31-05-2015]

34. In a basket there are 50 flowers. A man goes to worship and pray as many flowers in each temple as there are temples in the city. Then he needs 8 basket of flowers. Find the number of temples in the city.

(A) 15 (B) 20

(C) 25 (D) 30

[DSSSB Moteor Vehicle Inspector, 28-12-2014]

35. On a road map, 1 cm represents 10 km. So, $1\frac{5}{8}$ cm on the map represents:

(A) 25 km (B) 16 km

(C) 16.25 km (D) 6.25 km

[DSSSB Lower Division Clerk LDC, 16-12-2014]

36. What is the value of 2^0?

(A) 2 (B) 1

(C) 0 (D) $\frac{1}{2}$

[DSSSB Lower Division Clerk LDC, 16-12-2014]

37. Out of 64 candidates who have passed at least in one subject in a combined test in English and Hindi, 45 passed in English and 52 passed in Hindi. How many have passed in both the subjects?

(A) 12 (B) 19

(C) 33 (D) 35

[DSSSB Head Constable & Forest Guard, 28-09-2014]

38. When 'n' is divided by 5, the remainder is 2. What is the remainder when (n^2) is divided by 5?

(A) 2 (B) 4

(C) 3 (D) 1

[DSSSB Fire Operator, 31-08-2014]

39. The sum of two numbers is 5 and their product is 6. The sum of their squares is:

(A) 30 (B) 61

(C) 36 (D) 13

[DSSSB Fire Operator, 31-08-2014]

40. How many of the following members are divisible by 9?

1231, 2367, 6462, 5354, 7020, 1341

(A) 3 (B) 4

(C) 5 (D) 2

[DSSSB Matron and Warden, 29-06-2014]

41. The sum of two numbers is 21. If the larger is divided by the smaller, the quotient is 2 and the remainder is 3. The numbers are:

(A) 6, 15 (B) 5, 16

(C) 10, 11 (D) None of these

[DSSSB Field Clerk (Male), (2019)]

42. A natural number is 15 more than its one fourth part. Find the number:

(A) 20 (B) 16

(C) 26 (D) 10

[DSSSB PGT Stenographer (Hindi)]

Explanatory Solutions

1. (A) Given the number Y587X is exactly divisible by 90.

That means, the number Y537X will be completely divisible by both 9 and 10.

To be divisible by 9

Sum of digits = Y+5+8+7+X

= 20 + X + Y

we know that if the sum of the digits of a number is divisible by 9 then the number is divisible by 9. so

X + Y = 7 ...(i)

to be divided by 10

X = 0 ...(ii)

[∴ To be divisible by 10 the number must have a zero at the end of the number]
from eqn (i) and eqn (ii)
Y = 7
∴ Y – X = 7 – 0 = 7

2. (A) the unit digit of $(98)^{68} \times (55)^{62} \times (27)^{91}$
⇒ The unit digit of $[(98)^4]^{17} \times [(55)^2]^{31} \times [(27)^4]^{22} \times (27)^3$
⇒ The unit digit of $[6 \times 5 \times 1^{22} \times (27)^3]$
⇒ The unit digit of [30 × 27 × 27 × 27]
= 0

3. (D) Given the number 537XY is exactly divisible by 90.
That means the number 537XY will be completely divisible by both 9 and 10 to be divided by 9.
sum of digits = 5 + 3 + 7 + X + Y
= 15 + X + Y
we know that if the sum of the digits of a number is divisible by 9, then the number is divisible by 9.
∴ X + Y = 7 ...(i)
To be divisible by 10
Y = 0 ...(ii)
Hence, the value of (X + Y) = 3

4. (C) The unit digit of $(58)^{96} \times (56)^{25} \times (89)^{28}$
⇒ The unit digit of $[(58)^4]^{24} \times [(56)^5]^5 \times [(89)^4]^7$
⇒ The unit digit of 6 × 6 × 1
= 6

5. (C) Unit digit of $[3^{53} – 6^{38} + 27^{56}]$
= unit digit of $[3^1 – 6^2 + 7^4]$
= unit digit of [3 – 6 + 1]
= unit digit of [– 2]
= unit digit of [10 – 2]
= 8

6. (A) If the number 98A89B is divisible by 48, then the number is divisible by both 8 and 6. for divisibling by 8, the last 3 digits of the number must be divisible by 8.
If 89 B is divisible by 8 than B = 6
for divisible by 6, the number will be divisible by both 3 and 2. The last digit of the number is 6 so it is divisible by 2 and for divisibiling 3
9 + 8 + A + 8 + 9 + 6 = 40 + A, is divisible by 3
∴ A = 2 or 5 or 8
Hence. A + B = 2 + 6 = 8

7. (A) $P(n) = 2 \times 4^{2n+1} + 3^{3n+1}$
$= 2 \times 2^{2(2n+1)} + 3^{3n+1}$
$= 2^{4n+3} + 3^{3n+1}$
$P(1) = (2)^{4+3} + (3)^{3+1}$
$= (2)^7 + (3)^4$
= 128 + 81
= 209
which is divisible by 11

8. (A) Even number from 2 to 42. = 2, 4, 6, 8, ... 42

$$\text{even number } (n) = \frac{\text{last term} - \text{first term}}{\text{difference}} + 1$$

$$= \frac{42-2}{4-2} + 1$$
= 21
sum of first n even number
$= n(n + 1)$
Hence, sum of first 21 even number
= 21 (21 + 1)
= 21 × 22
= 462

9. (A) Given number = 1*a*2*b*3*c*
To be a number divisible by 11
[(*a* + *b* + *c*) – (1 + 2 + 3] = [(*a* + *b* + *c*) – 6] must be divisible by 11.
To be divisible by 11.
a + *b* + *c* = 6
By options,
a = 4
b = 0
c = 2

10. (D) For a number to be divisible by 16, it must be divisible by 4. A number that is divisible by 4 must have is last two number divisible by 4. It the minimum value of a will be 0.

11. (B) Smallest number divisible by 8, 10, 12, 18, 24
= LCM of 8, 10, 12, 18, 24
= 360
∴ Required four digit = 360 × 3
= 1080
Hence, required sum = 1 + 0 + 8 + 0
= 9

12. (B) When a number is divided by 308, the remainder is 60 and when divided by 28,
308) N (
R ⇒ 60
→ 308 + 60 → 368 number
28) 368 (13
28↓
88
84
4 Remaindes

13. (C) When the number is divisible by 8 then its last three digit will be divisible by 8
∴ N = 6
when number is divisible by 9, then the sum of its digits is divisible by 9
∴ 7 + *m* + 5 + 2 + 8 + 5 + 6 + 33 + *m*
∴ *m* = 3
Hence the correct Answes is option (C).

14. (C) Given
the cost of (2 pencils + 3 books + 4 erasers) = 15 ...(i)
and the cost of (3 pencils + 2 books + 1 eraser) = 10 ...(ii)
Addition on both eqn.
5 pencils + 5 books + 5 erasers = 15 + 10 = 25
5 (1 pencil + 1 book + 1 eraser) = 25
1 pencil + 1 book + 1 eraser
$= \frac{25}{5} = ₹ 5$
then the cost of 3 pencil + 3 book + 3 erasers = 5 × 3 = ₹ 15

15. (D) Population of city A = 84,000
rate of decrease per year = 1,400
population of city B= 38,000
rate of increase per year = 900
total change in city A and city B
= 1,400 + 900
= 2,300
difference in population of both city
= 84,000 – 38,000
= 46,000
Hence required year $= \frac{46,000}{2,300}$
= 20 year

16. (A) According to question
Given three prime numbers are *x, y, z*
$x \times y = 527$, $y \times z = 1147$
on factorization
$x \times y = 17 \times 31$
$y \times z = 31 \times 37$

on comparing

$x = 17, y = 31, z = 37$

$\therefore\ x + y + z = 17 + 31 + 37 = 85$

17. (C) From option (A), $(0.9)^2 = 0.81$

From option (B), $1 - (0.9)^2$

$= 1 - 0.81$

$= 0.19$

From option (C), $(0.09)^2 = 0.0081$

From option (D), 0.09

$= 0.09$

Hence it is clear from above that $(0.09)^2$ is closest to zero.

18. (C) $2.\overline{63} = \frac{263-2}{99} = \frac{261}{99} = \frac{87}{33}$

19. (A) speed of x's elevator = 15 floors/ minuts

speed of y's elevator = 20 floors/ minuts

then relative speed = 20 + 15 = 35 floors/ minuts

floor between x and y = 107 – 2

= 105 floor

$\therefore$ meeting time $= \frac{105}{35} = 3$ minutes

$\therefore$ floors covered by X in 3 minutes

$= 15 \times 3$

= 45 floors

Hence, required floor = 2th + 45

= 47th

20. (D) from option (D)

statement (iv)

$\frac{555555}{7} = 79{,}365$

$\frac{555555}{11} = 50{,}505$

$\frac{555555}{13} = 42{,}735$

Hence statement (IV) is absolutely correct.

21. (C) I. $\frac{3}{11} > 0{\cdot}3$

$\Rightarrow \frac{3}{11} > \frac{3}{10}$

$\Rightarrow 30 > 33$ (wrong)

II. $\frac{7}{8} > 0{\cdot}86$

$\Rightarrow \frac{7}{8} > \frac{86}{100}$

$\Rightarrow \frac{7}{8} > \frac{43}{50}$

$350 > 344$ (correct)

Hence only statement (II) are correct

22. (A) H.C.F of 703, 851 and 333 = 37

so each packet will be of 37 kgs.

and number of packet

= 19 + 23 + 9

= 51

23. (D) L.C.M of 8 and 12 = 24

$\therefore$ smallers number of three digits = 120

Three digit number which when divided by 8 and 12 leaves remainders 6 and 10 respectively.

= 120 – (8 – 6)

= 120 – 2 = 118

$\therefore$ A = 118

B = LCM of 7 and 8

= 56

$\therefore$ A + B = 118 + 56

= 174

24. (D) Let the price of television = ₹ x

and price of radio = ₹ y

According to question,

$4x + 6y = 18480$

$\Rightarrow 2x + 3y = 9240$ ...(i)

or $2x + 14y = 18480$

$\Rightarrow x + 7y = 9240$ ...(ii)

from eqn $7 \times$ (i) – $3 \times$ (ii)

$(14x + 21y) - (3x + 21y)$

$= 64680 - 27720$

$\Rightarrow 11x = 36960$

$\therefore\ x = \frac{36960}{11} = 3360$

25. (B) Let number be x.

According question

$3x - \frac{x}{3} = 24$

$\Rightarrow \frac{9x - x}{3} = 24$

$\Rightarrow \frac{8x}{3} = 24$

$\Rightarrow 8x = 3 \times 24$

$\Rightarrow x = \frac{3 \times 24}{8} = 9$

26. (D) If a number is divisible by 6, then then its unit digit is even and the sum of the digits is divisible by 3.

$\therefore\ 5 + 2 + * = 7 + *$

$\therefore\ * = 2$

27. (B) We know that $(a^n - b^n)$ is exactly divisible by the $(a - b)$.

$\therefore\ 3^{4n} - 4^{3n} = (3^4)^n - (4^3)^n$

$= 81^n - 64^n$

Hence, required number

= 81 – 64

= 17

28. (C) $\because$ time taken to manufacture × cars

= 7 day

$\therefore$ time taken to manufacture 1 car

$= \frac{7}{x}$ day

$\therefore$ time taken to manufacture 60 cars

$= \frac{7 \times 60}{x}$

$= \frac{420}{x}$ day

29. (B) According to question

number of boys or girls in each section = H.C.F of 378 and 675 = 27

$\therefore$ Number of sections in the school

$= \frac{378}{27} + \frac{675}{27}$

$= 14 + 25$

$= 39$

30. (C) The larget 5 digits number divisible by 100 is 99900

31. (B) $7^{1287} = (7^3)^{429}$

$= (343)^{429}$

$= (344 - 1)^{429}$

In this condition

Remainder $= (-1)^{429} = -1$

$\therefore$ requined remainder = 172 – 1

= 171

32. (D) If the total amount = 5,86,700

According to question

$\therefore$ amount get by each person

$= \frac{586700}{25} =$ ₹ 23468

33. (B) Let the number of students in room A = x

and the number of students in room B = y

First condition

$x - 10 = y + 10$

$x - y = 10 + 10$

$x - y = 20$ ...(1)

Second condition

$x + 20 = 2(y - 20)$

$\Rightarrow x + 20 = 2y - 40$

$\Rightarrow 2y - x = 20 + 40$

$\Rightarrow 2y - x = 60$ ....(2)

eqn (1) × 2 + (2),

$2x - 2y + 2y - x = 40 + 60$

$\therefore\ x = 100$

Hence, the number of students are 100

34. (B) Let the number of temple in the city = x

and total number of flowers

$= 50 \times 8$

$= 400$

A. T. Q

$x^2 = 400$

$x = \sqrt{400} = 20$

35. (C) 1 cm ≡ 10 km

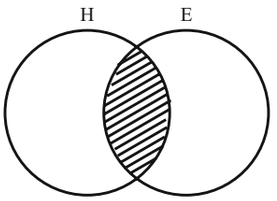
$\therefore\ 1\frac{5}{8}$ cm $\equiv \frac{10 \times 13}{8}$ km.

$= 16.25$ km.

36. (B) $a^0 = 1$

$\therefore\ 2^0 = 1$

37. (C)



passed students in the both subject

$= 45 + 52 - 64$

$= 33$

38. (B) Let the number 7 be divided by 5

$\therefore$ Remainder = 2

now $7^2 = 49$

Now dividing 49 by 5, remainder = 4

Hene Required remainder = 4

39. (D) Let two number are x and y

$x + y = 5$

$xy = 6$

$x^2 + y^2 = ?$

$\therefore\ (x+y)^2 = x^2 + y^2 + 2xy$

$(5)^2 = x^2 + y^2 + 2 \times 6$

$25 = x^2 + y^2 + 12$

$x^2 + y^2 = 25 - 12 = 13$

40. (B) A number is divisible by 9 if the sum of its digits is divisible by 9.

Sum of digit of 2367

$= 2 + 3 + 6 + 7$

$= 18$

Sum of digit of 6462

$= 6 + 4 + 6 + 2$

$= 18$

Sum of digit of 7020

$= 7 + 0 + 2 + 0$

$= 9$

Sum of digit of 1341

$= 1 + 3 + 4 + 1$

$= 9$

Hence 4 numbers are divisible by 9.

41. (A) Let larger number = x

and smaller number = $21 - x$

We know that

Dividend = divisor – quotient + remainder

$\Rightarrow x = (21 - x) \times 2 + 3$

$\Rightarrow x = 42 - 2x + 3$

$\Rightarrow x + 2x = 42 + 3$

$\Rightarrow\ 3x = 45$

$\Rightarrow\ x = \frac{45}{3} = 15$

Hence, larger number = $x = 15$

and smaller number $= 21 - x$

$= 21 - 15$

$= 6$

42. (A) Let natural number = x

A. T. Q., $x - 15 = \frac{x}{4}$

$4x - 60 = x$

$3x = 60$

$x = 20$

■■■