NUMBER SYSTEM

1. What least number must be added to 8961 to make it exactly divisible by 84?
   (a) 25
   (b) 27
   (c) 29
   (d) 35
   (e) None of these

2. The sum of two number is 14 and their difference is 10. Find the product of the two numbers.
   (a) 24
   (b) 36
   (c) 48
   (d) 52
   (e) None of these

3. The sum of two number is twice their difference. If one of the number is 10, find the other number.
   (a) 24
   (b) 26
   (c) 28
   (d) 30
   (e) None of these

4. The number obtained by interchanging the digits of a two digit number is less than the original number by 18. If sum of the digits is 6, what was the original two digit number?
   (a) 51
   (b) 24
   (c) 42
   (d) 15
   (e) None of these

5. $2^{71} + 2^{72} + 2^{73} + 2^{74}$ is divisible by
   (a) 9
   (b) 10
   (c)11
   (d) 13

6. If n is even, $(6^{n}-1)$ is divisible by
   (a) 37
   (b) 35
   (c)30
   (d)6

7. On dividing 397246 by a certain number, the quotient is 865 and the reamainder is 211. Find the divisor.
   (a) 459
   (b) 759
   (c) 325
   (d) 851

8. A number when divided by 897 gives a remainder 73. If the same number is divided by 23, the remainder will be :
   (a) 10
   (b) 5
   (c) 4
   (d) 2

9. If a number is divided by 36 and leaves remainder 23. If cube of this number is divided by 12. Then what is the remainder.
   (a) 11
   (b) 14
   (c) 15
   (d) 13

10. Two number when divided by 17. Leave remainder 13 and 11 respectively if the sum of those two numbers is divided by 17 the reaminder will be
    (a) 8
    (b) 7
    (c) 5
    (d) 4

11. The least possible number when successively divided by 2, 5, 4, 3 gives respective remainders of 1, 1, 3, 1 is :
    (a) 372
    (b) 275
    (c) 273
    (d) 193

12. A least number when successively divided by 2, 3, 5 it leaves the respective remainder 1, 2 and 3. What will be the remainder if this number will be divided by 7 ?
    (a) 4
    (b) 9
    (c) 7
    (d) 8

13. Which of the following number will not completly divide the $(29)^{37} + (17)^{37}$?
    (a) 2
    (b) 11
    (c) 23
    (d) 46

14. $(49)^{15}-1$ is exactly divisible
    (a) 50
    (b) 51
    (c) 29
    (d) 8

15. Which of the following will not divide $23^{10}-1024$ completly.
    (a) 3
    (b) 5
    (c) 7
    (d) 4

16. The quotient when 10^{100} is divided by 5^{75}

(a) 10^{25} (b) 2^{75}

(c) $2^{75}x10^{25}$ (d) $2^{25}x10^{100}$

17. The remainder obtained when $23^{3}+31^{3}$ is divided by 54

(a) 0 (b) 1

(c) 3 (d) C.N.D

18. $(19^{5}+21^{5})$ is divisible by

(a) only 10 (b) only 20

(c) Both 10 & 20 (d) Neither10 &
20

19. If $(17)^{41}+(29)^{41}$ is divided by 23.

(a) 1 (b) 6

(c) 0 (d) 12

20. In a division sum, the divisor is 10 times the quotient and 5 times the reaminder. If the reaminder is 48, the dividend is :

(a) 5708 (b) 4852

(c) 5284 (d) 5808

21. The sum of first 20 odd counting numbers is :

(a) 20 (b) 100

(c) 400 (d) 313

22. Find the sum first 45 natural numbers :

(a) 1035 (b) 1235

(c) 1135 (d) 1305

23. Find the value of 1+2+3+.......+210 :

(a) 22155 (b) 21255

(c) 22515 (d) 22255

24. Find the sum first 50 odd numbers :

(a) 6250 (b) 2500

(c) 2520 (d) 2450

25. Find the value of 2+4+6+....+56th even number:

(a) 3912 (b) 3192

(c) 3219 (d) 3129

26. Find the value of $1^{2}+2^{2}+....+25^{2}$:

(a) 5255 (b) 5525

(c) 5552 (d) 5252

27. Find the no. of zeroes in

40× 45 × 50 × 55 ×65 ×125 ×200

(a) 10 (b) 12

(c) 9 (d) 11

28. Find the greatest power of 7 in 500

(a) 80 (b) 82

(c) 79 (d) 81

29. Find the number of divisors of 3600.

(a) 40 (b) 42

(c) 45 (d) 41

30. Find the sum of divisors of 480, excluding itself.

(a) 1512 (b) 1212

(c) 1032 (d) 1132

HINTS & SOLUTION

1. b 2.a 3. d

4. c; Let the original number be 10x + y.

Number obtained by interchanging the digits = 10y + x

Now, according to the question,

10x + y – 10y – x = 18

9x - 9y = 18

x - y = 2 ... (i)

Again, x + y = 6 ... (ii)

From equations (i) and (ii),

x = 4 and y = 2

Original number = 10 × 4 + 2 = 42

5. b Expression= $2^{71}(1 + 2 + 4 + 8)$

$= 2^{71} \times 15 = 2^{71} \times 3 \times 5$

6. b When n = 2.

$6^n - 1 = 6^2 - 1 = 36 - 1 = 35$

When, n = an even number,

$a^n - b^n$ is always divisible by $(a^2 - b^2)$

7. a 8.b

9. a

$36\overline{)\,n\,(}Q$

23

$N = 36Q + 23$

Cube of number

$= N^3 = (36Q + 23)^3$

Now, $\frac{(\overset{\overset{0}{\uparrow}}{36Q} + \overset{\overset{-1}{\uparrow}}{23})^3}{12}$

$= \frac{(-1)^3}{12} = \frac{-1}{12}$

Remainder = 12 – 1 = 11

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10. b N_1 (First Number) = 17x + 13

N_2 (Second No.) = 17y + 11

$$\frac{(N1 + N2)}{17} = \frac{17(x+y)}{17} + \frac{13+11}{17}$$

Remainder = 24/17 = 7

11. d Step 1. (1 + 3) × 4 = 16

Step 2. (16 + 3) × 5 = 95

Step 3. (95 + 1) × 2 = 192

Step 4. (192 + 1) = 193

12. a **Step. I** 5 × 1 + 3 = 8

Step. II 8 × 3 + 2 = 26

Step . III 26 × 2 + 1 = 53

So the least number = 53

According to the question, 53 is divided by 7 then remainder = 4

13. b

$(29^{37} + 17^{37}), (29 + 17) = 46$ Completely divisible by $46 = 1, 2, 23, 46$

This will be completely divisible by all the factors of 46 So 11 will not divide the given number.

14.d

$x^n – a^n$ is exactly divisible by (x – a) if n is odd.

$(49)^{15} – (1)^{15}$ is exactly divisible by 49 – 1 = 48, that is a multiple of 8.

15. d

1024 is the value of 2^{10} and

$23^{10} – 2^{10}$ (23 – 2) and (23 + 2) is comply divisible (23 – 2) = 21 = 1, 3, 7, 21 (23 + 2) = 25 = 1, 5, 25

Hence this number is not divisible by 4.

16. c

$10^{100} \div 5^{75}$

$$\frac{2^{100} \times 5^{100}}{5^{75}} = 2^{100} \times 5^{25} = 2^{25}.2^{75}.5^{25}$$

$= 2^{75} \times 10^{25}$

17.a

We know that $(a^n + b^n)$ is always divisible (a + b) then.

where n odd power

$(23^3 + 31^3)$ is Always divisible by (23 + 31) = 54

So remainder is '0'.

18. c

$(a^n + b^n)$, is always divisible by (a + b)

when n odd power

(19 + 21) = 40

Factor of 40 (1, 2, 4, 5, 10, 20, 40) is divisible by $(19^5 + 21^5)$ then options 10 & 20 is divisible.

19.c

$(a^n + b^n)$, is always divisible (a + b)

When n is odd power

Then,

$(17^{41} + 29^{41})$ is always divisible by (17 + 29) = 46

Factor of 46 (1, 2, 23, 46)

So, $(17^{41} + 29^{41})$ is perfectly divisible by 23 hence, Remainder '0'.

20. d

Remainder = 48

Divisor = 5 × 48 = 240

Quotient = 240/10 = 24

Dividend = divisor × quotient + remainder

= 240 × 24 + 48

= 5760 + 48 = 5808

21. c

Sum of AP of first 20 odd numbers

1 + 3 + 5 + 7 + ... is given by

or Here, n = 20

Sum = $n^2 = 20^2$

= 400.

22. a

Here n = 45

We know sum

= 45 × 23

= 1035.

23. a

1+2+3+........+210

Here, n = 210

= 105 × 211

= 22155

24. b

Here, n = 50

We know sum of Ist ‘n’ odd nos is n^2

S = 2500

25. b Here, n=56

We know sum of Ist ‘n’ even nos is n(n+1)

S=56×57 = 3192

26. b

27. 40× 45 × 50 × 55 ×65 ×125 ×200

The above expression can be written in the form of prime factors is

Step I $2^3 \times 5 \times 3^2 \times 5 \times 5^2 \times 2 \times 11 \times 5 \times 2^6 \times 5^3 \times 2^3 \times 5^2$

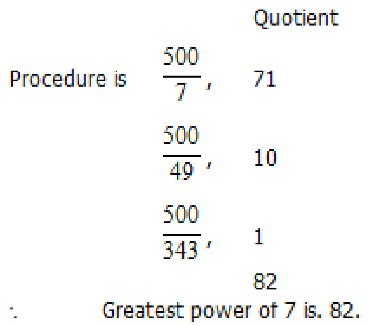
Step II Taking only 2 & 5 Þ 2^{12} ´ 5^{10}

Here, m = 12, n = 10

m > n

No. of zeroes = n = 10

28. b



Quotient

Procedure is $\frac{500}{7}$, 71

$\frac{500}{49}$, 10

$\frac{500}{343}$, 1

82

∴ Greatest power of 7 is. 82.

29. c 30. b