SOLUTIONS

1. (d) If the sum of digits is divisible by 9, Then the whole number will be divisible by 9.
Sum of digits of the number $8x5215 = 21 + x$
Hence By Option(d), $x = 6$.

2. (d) If any number N has only two factors 1 and N, Then the number is the Prime Number.
Option(d) 89 has only two factors which are 1 and 89 only.
Hence, Option(d) is correct.

3. (a)

A	B	C
↓	↓	↓
$x+23$	$x+16$	x(Let)

Given that,
$A + B + C = 255$
Then, $(x + 23) + (x + 16) + x = 255$
$\Rightarrow 3x + 39 = 255$
$\Rightarrow 3x = 255 - 39$
$\Rightarrow 3x = 216$
$\Rightarrow x = \frac{216}{3} = 72$
Hence, C = 72, B = 88, A = 95
Now the value of,
$3A + C - 4B = 3(95) + 72 - 4(88)$
$= 285 + 72 - 352$
$= 357 - 352 = 5$

4. (d) Given Number = 647592
Rearranged Number = 245679
Here the sum of digits of rearranged number = 33
Hence, the Number will be divisible by 3

5. (c) 312, 936, 1872 and 7176 are divisible by 156
$\frac{312}{156} = 2; \frac{936}{156} = 6;$
$\frac{1872}{156} = 12; \frac{7176}{156} = 46$
Hence Required Answer = 4

6. (d) The factor of 196 = 1, 2, 4, 7, 14, 28, 49, 98, 196
Number of factors which are divisible by 4 = 3

7. (b) Given Number = $72x8431y4$
We know, if a number is divisible by 9 and 4, the number will be divisible by 36
If the number's last two digits are divisible by 4, the entire number will also be divisible by 4.
If the number's sum of digits is divisible by 9, the entire number will also be divisible by 9
Now,
Last two digit of $72x8431y4$ is y4
We can assume y = 0, 2, 4, 6, 8
sum of digits = $29 + x + y$
Here, assume such values of x and y so that the sum will be divisible by 9.
if we assume y = 0 the option will not satisfy hence we will assume another value.
Therefore, y = 2 then $x = 5$
$\frac{x}{y} - \frac{y}{x} = \frac{5}{2} - \frac{2}{5}$
$= \frac{25-4}{10} = \frac{21}{10} = 2\frac{1}{10}$

8. (b) Sum of the number is
$= 13 + x + y$
Assume the minimum value of $(x + y)$ so that the sum will be divisible by 9.
Hence, The value = 5

9. (b) Number = 150328
Rearranged Number = 853210
Resultant Number
$= 853210 - 5 \times 13$
$= 853210 - 65 = 853145$
Last Digit of the resultant number is 5
Hence the resultant number will be divisible by 5

10. (c) Given Number = 34R05030M6
if the number's last 4 digits is divisible by 16, the entire no will also be divisible by 1
Last 4 digits = 30M6
With the help of basic division you will get M = 5
if the difference of the sum of digit at odd position and sum of digits at even position in a number is 0 or 11, the number will be divisible by 11.
Hence,
$(3 + R + 5 + 3 + M) - (4 + 0 + 0 + 0 + 6)$
$= 11 + R + M - 10$
$= 11 + R + 5 - 10$
$= 16 + R - 10$
$= 6 + R$
Hence, R = 5
Required Answer (c)

11. (d) Number = 6336633P
ATQ, Number is divisible by 132
We know, $132 = 2 \times 2 \times 3 \times 11$
Hence, We can say that number is also divisible by 11.
We will use the concept of divisibility of 11
$\therefore$ sum of odd places digit = sum of even places digit
$\Rightarrow 6 + 3 + 6 + 3 = (3 + 6 + 3 + P)$
$\Rightarrow 18 = 12 + p$
$\Rightarrow 18 - 12 = P$
$\Rightarrow 6 = P$

12. (a) Sum of digit of the Number $= 30 + x$
$\because$ 30 + [15] = 45, which is divisible by 9.
Hence, $x = 15$

13. (d) Let 476**0 = 476xy0
Sum of Digits = $17 + x + y$
By the divisibility rule of 11
$\Rightarrow 4 + 6 + y = 7 + x + 0$
$\Rightarrow 10 + y = 7 + x$
From option (d)
y = 5 and $x = 8$

14. (d) [If sum of digits of a number is divisible by 3, the entire number will be divisible by 3]
Sum of digits = 19 + y
Hence, y = 2

15. (b) Given
Number = 27B58A4
[Divisibility by 8 = Check last three digit]
$\therefore$ 8A4 ÷ 8 → minimum value of A = 2
by the divisibility rule of 11–
$2 + B + 8 + 4 = 7 + 5 + A$
$\Rightarrow 14 + B = 12 + 2$
$\Rightarrow 14 + B = 14$
$\Rightarrow B = 0$
Hence, A + B = 2

16. (d) Factor of $88 = 8 \times 11$
For the smallest possible natural number of y–
$\Rightarrow$ 2y8 will be divisible by 8
$\Rightarrow$ So, y will be 4 for 248, which is divisible by 8

As y = 4,
Now the number is – 97x456248
As y = 4, The possible value of x for which 97x456248 will be divisible by 11.
Sum of odd places digit in number = 8 + 2 + 5 + x + 9
= 24 + x
Again, sum of even places digit in number = 4 + 6 + 4 + 7 = 21
Difference = 24 + x – 21
= 3 + x
Hence for x + 3 to be divisible by 11,
x = 11 – 3 = 8
Therefore, $x^2 + y^2 = 8^2 + 4^2$
= 64 + 16 = 80

17. (d) We know, if the last three digits of a number is divisible by 8, the number will be divisible by 8.
For the least possible value of p–
⇒ p48 will be divisible by 8.
Hence, p = 0

18. (b) LCM of 2 and 7 = 14
When we divide 1000 by 14 we get 71 as quotient and 6 as remainder.
Therefore, There is 71 numbers which are divisible by both 2 and 7.

19. (c) Prime factorization of 216
$= 2^3 \times 3^3$
Sum of odd divisors
$= (3^0 + 3^1 + 3^2 + 3^3)$
= (1 + 3 + 9 + 27) = 40

20. (a) Prime factor of 198 = 3 × 6 × 11
Hence, Any number (Say N) is divisible by 198 if the number is divisible by 3, 6 and 11.
If we rearrange the digit of the number the divisibility rule of 6 and 11 will hamper; but the divisibility rule of 3 is based on the sum of digits which will not change.
Hence, The new Number is divisible by 3.

21. (b) Number = 763254
New Number = 763254 – 5 × 41
= 763254 – 205
= 763049
⇒ 763049 is divisible by 7

22. (a) Given, 55p1067q9 is divisible by 99
i.e., The number is also divisible by 9 and 11.
Sum of digits = 33 + p + q .....(1)
If the number of divisible by 9 i.e. sum will be divisible by 9.
Again, By the divisibility rule of 11–
⇒ 5 + p + 0 + 7 + 9 – (5 + 1 + 6 + q)
⇒ 21 + p – (12 + q)
⇒ 21 + p – 12 – q
⇒ 9 + p – q .....(2)
Assume such values of p and q that satisfies the eqn. -1 & eqn.-2 with respect to divisibility rule of 9 and 11
So, p = 7 and q = 5
Product = 35

23. (b) Assume Larger Number = x and Smaller Number = y
⇒ x – y = 3951 .....[1]
ATQ, When the larger number is divided by smaller number we get–
Quotient = 12 and Remainder =13
We know–
Dividend = Divisior × Quotient + Remainder
⇒ x = y × 12 + 13
⇒ x – 12y = 13 .....[2]
On substracting Equation [1] & [2], we get–
⇒ x – y – x + 12y = 3951 – 13
⇒ 11y = 3938
⇒ y = 358
From Equation[1], x = 3951 + 358
= 4309
Thus, The sum of digits
= 4 + 3 + 0 + 9 = 16

24. (c) Correct Answer = +5 Marks
Incorrect Answer = –2 Marks
Marks Scored = –12 Marks
Number of questions answered correctly = 4
Let the total number of question be x
ATQ,
⇒ 4 × 5 + (x – 4) × (–2) = –12
⇒ 20 – 2x + 8 = –12
⇒ –2x = – 12 – 28
⇒ –2x = – 40
⇒ x = 20
Number of question answered incorrectly = 20 – 4 = 16

25. (a) ⇒ 23 × 224 = a × 322
$\Rightarrow a = \frac{23 \times 224}{322}$
⇒ a = 16

26. (d) Given Number = 51&918#0
Sum of Digits = 24 + & + #
Assume such value of & and # from the options so that sum will be divisible by 9.
By Option (d)–
Sum of digits = 24 + 8 + 4 = 36 (divisible by 9)
Hence, Answer (d)

27. (d) [1433 × 1433 × 1422 × 1425] ÷ 12
Remaining = ?
$\left(\frac{1433}{12}\right)\left(\frac{1433}{12}\right)\left(\frac{1422}{12}\right)\left(\frac{1425}{12}\right)$
Remainder 5569
$\Rightarrow 5 \times 5 \times 6 \times 9 = \frac{1350}{12}$
Remainder = 6

28. (d) 785x3678y divided by 72
$8 \times 9 \ \frac{78y}{8}$ So y = 4
785x36784 divided by 9
x = 6
x – y = 6 – 4 = 2

29. (d) $x \times x$ = 2209
x^2 = 2209
x = 47

30. (d) 75 × 73 × 78 × 76 Divisible by 34, Remainder = ?
$\frac{75}{34} \times \frac{73}{34} \times \frac{78}{34} \times \frac{76}{34}$
Remainder = 7 × 5 × 10 × 8
$\Rightarrow \frac{2800}{34}$ = Remainder = 12

31. (b) 72 × 73 × 78 × 76 Divisible by 35,
Remainder = ?
$\frac{72}{35} \times \frac{73}{35} \times \frac{78}{35} \times \frac{76}{35}$
Remainder = $2 \times 3 \times 8 \times 6 = \frac{288}{35}$,
Remainder = 8

32. (c) 5x2y6z, divisible by, 7, 11, 13
Number 1001 divisible by 7, 11, 13
So ___ 5x2y6z
x = 6
y = 5
z = 2
No – 562562 is divided by 7, 11, 13
(x – y + 3z) = (6 – 5 + 3 × 2) = 7

33. (d) $x \times x$ = 2809
$x^2 = 53^2$
x = 53

34. (c) LCM of 5, 6, 7 = 210
I – 210 × 1 = 210
II – 210 × 2 = 420
III – 210 × 3 = 630
Between 400 and 700
420 and 630, 2 Numbers

35. (a)

3		51
	2	
4		12
	3	
7		1
	5	

$\because 7 \times 1 + 5 = 12$
$12 \times 4 + 3 = 51$
$51 \times 3 + 2 = 155$

So, $\frac{155}{84}$, Remainder = 71

36. (b) $1433 \times 1433 \times 1422 \times 1425$ divisible by 10, Remainder = ?
$\because$ Last digit 5 and 2 multiple given last digit 0
If any numbers last digit is zero, and that number are divided by 10, Remainder will be zero
Remainder = 0

37. (d) LCM of 15, 18, 36

$\Rightarrow \frac{180k + 9}{11} = \frac{4k + 9}{11}$, k = 6

$\Rightarrow \frac{180 \times 6 + 9}{11} = \frac{1089}{11}$

Sum of digit = 1 + 0 + 8 + 9 = 18

38. (a) $785x3678y$,
Divisible by 72, 8×9

$\frac{78y}{8}$, y = 4

$\frac{785x36784}{9}$, $x = 6$

$(x + y) = 6 + 4 = 10$

39. (c) LCM of 5, 6, 8 = 120
Number between = 300 – 700
I – $120 \times 3 = 360$
II – $120 \times 4 = 480$
III – $120 \times 5 = 600$
Total = 3

40. (d)

3		51
	2	
4		12
	3	
7		1
	5	

$7 \times 1 + 5 = 12$
$12 \times 4 + 3 = 51$
$51 \times 3 + 2 = 155$

$\frac{155}{42}$, Remainder = 29

41. (a) 6 digit number in which 3 digit repeat $xyzxyz$ is divisible by 1001
Comparing on 479479 to 479xyz
$x = 4$, y = 7 and z = 9

Now, $\frac{(y + z)}{x} = \frac{7 + 9}{4} = \frac{16}{4} = 4$

42. (d) $x468y05$ divisible by 11
Then,
Some of even place value
$\rightarrow 4 + 8 + 0 = 12$
Some of odd place value
$\rightarrow x + 6 + y + 5 = x + y + 11$
Put, $x + y = 12$

$\frac{x + y + 11 - 12}{11} = \frac{12 + 11 - 12}{11} = \frac{11}{11} = 1$

So,
$x + y = 12$

43. (a) Number less than 1000 are divisible by 5 are = $\left(\frac{1000}{5} - 1\right)$
= 199
Number less than 1000 are divisible by 7 are = $\frac{1000}{7}$ = 142
Number less than 1000 are divisible by 35 are = $\frac{1000}{35}$ = 28
Number less than 1000 are divisible by 7 or 5 but not 35 are
= 199 + 142 – (2 × 28)
= 341 – 56 = 285

44. (d) $65 \rightarrow 13 \times 5$
$= 13 \times n + 56$
put n = 10
$= 13 \times 10 + 56 = 186$
divided 186 by 65 it gives remainder 56
So, After divideing 186 by 13 gives remainder = 4 $x = 4$
$= \sqrt{5x - 2} = \sqrt{5 \times 4 - 2} = \sqrt{18} = 3\sqrt{2}$

45. (d) LCM of (16, 24, 30, 36 and 45) is
LCM = $2 \times 2 \times 2 \times 2 \times 3 \times 3 \times 5$
= 720
As we know,
Number is perfect square
LCM = $2 \times 2 \times 2 \times 2 \times 3 \times 3 \times 5 \times 5$
= 3600
When 3600 is divided by 123,
Then the remainder is 33

46. (d) 538xy is divisible by (3, 7 and 11)
value of $(x^2 + y^2)$
= put, $x = 2$, y = 3
then, 53823 is exactly divisible by (3, 7, 11)
So, $(x^2 + y^2) = ((2)^2 + (3)^2) = 13$

47. (b) As we know, $6 = 2 \times 3$
Check the options using the divisibility rule of 2 and 3.
$\Rightarrow$ 5643252 is exactly divisible by 6

48. (b) Number which are divisible by 'a' or 'b' = (Number divisible by 'a') + (Number divisible by 'b') – Number divisible by LCM of 'a' and 'b')
Now,
Number which are divisible by 3 or 4 up to 2001 are = $\frac{2001}{3} + \frac{2001}{4} - \frac{2001}{123}$ = 667 + 500 – 166 = 10001
Number which are divisible by 3 or 4 but not 5 = (Number divisible by 3 or 4) – (Numbner divisible by LCM of 3 and 5) – Number divisible by LCM of 4 and 5) + (Number divisible by LCM of 3, 4, and 5)
Number which is divisible by 3 or 4 but not by 5 upto 2001 are
$= \frac{2001}{15} + \frac{2001}{20} - \frac{2001}{60}$ = 1001 – 33 – 100 + 33 = 801

49. (d) Number 7306 – 6454 = 852
8797 – 7306 = 1491
8797 – 6454 = 2343
HCF of (852, 1491, 2343) = 213
6454 divided by 213
Remainder 64
d – r = (213 – 64) = 149

50. (c) Divisibility rule of 3 $\Rightarrow$ A number is divisible by 3 if the sum of its digit is divisible by 3
Divisiblity rule of 11 $\Rightarrow$ If the difference of the alternative sum of digit of the number is a multiple of 11
Sum of the digit of the number (1563241234351)
= (1 + 5 + 6 + 3 + 2 + 4 + 1 + 2 + 3 + 4 + 3 + 5 + 1) = 40
40 is not divisible by 3
Now, divisibility rule (11)
(5 + 3 + 4 + 2 + 4 + 5) – (1 + 6 + 2 + 1 + 3 + 3 + 1)
= (23 – 17) = 6
6 is not multiple of (11) so the number is not divisible by 11
Hence the given number is neither divisible by 3 nor by 11.