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The Banking Brains

Vikas Jangid, an experienced educator with over six years of expertise, Specializing in Quantitative Aptitude for bank exams like IBPS and SBI, Vikas Jangid simplifies complex concepts and shares practical strategies to help aspirants succeed. Having cleared the bank exam himself, he provides relatable guidance, teaching shortcuts and time-saving techniques to improve speed and accuracy. Beyond academics, he motivates students to build confidence and overcome challenges. Through his Youtube channel "The Banking Brains", Vikas Jangid has helped countless aspirants achieve their goals, making him a trusted mentor in competitive exam preparation.

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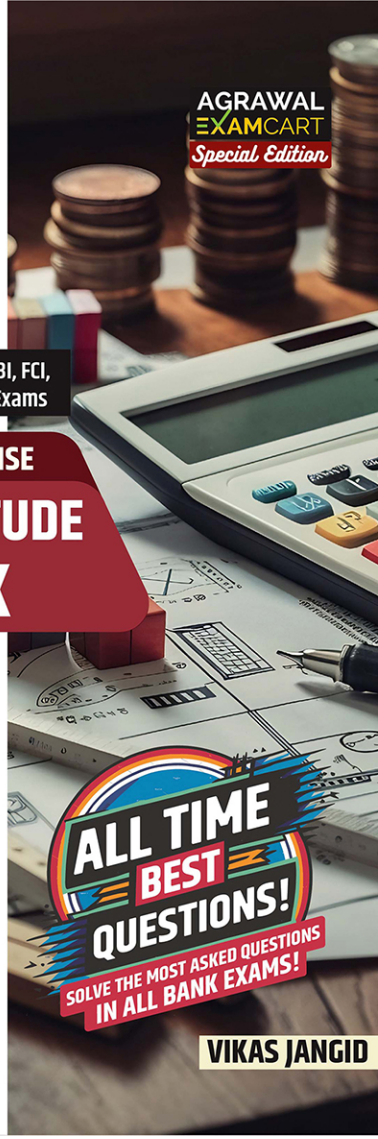

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Chapter

1

Number System

Type : 1
Questions Based on Definitions or Classification

Bank Clerk

1. If P is a two Prime number, what is the value of?
I. When P is divided by 4 and remainder is 3.
II. P is 2 more than multiple of 7.
(A) 70 (B) 59
(C) 79 (D) 56
(E) None of these
[RRB Office Scale-1, 2020]

2. Three consecutive positive even numbers are such that thrice the 1st number exceeds double the 3rd by 2, then the 3rd number is :
(A) 12 (B) 16
(C) 14 (D) 10
(E) None of these
[RRB Assistant 2020]

3. A number is interesting if on adding the sum of the digits of the number and the product of the digits of the number, the result is equal to the number. What fraction of numbers between 10 and 100 (both 10 and 100 included) in interesting ?
(A) 0.1 (B) 0.11
(C) 0.16 (D) 0.22
(E) 0.33
[IBPS Clerk Preliminary Solved Paper 2017]

4. When you reverse the digits of the number 13, then number increases by 18. How many other two-digit numbers increase by 18 when their digits are reversed ?
(A) 7 (B) 8
(C) 6 (D) 5
(E) 10
[IBPS Clerk Pre 2017]

5. '*mn*' is a two-digit prime number such that one of its digits is 3. If the absolute difference between the digits of the number is not a factor of 2, then how many values can '*mn*' assume ?
(A) 3 (B) 8
(C) 6 (D) 5
(E) 7
[SBI JA&JAA Bank Clerk Pre Solved Paper 2017]

6. If a number is multiplied by three-fourth of itself, the value thus obtained is 10800. What is that number ?
(A) 210 (B) 180
(C) 120 (D) 160
(E) 140
SBI JA & JAA Bank Clerk Preliminary Solved Paper 2016

7. By how much is 3/4th of 52 is less than 2/3rd of 99 ?
(A) 27 (B) 33
(C) 39 (D) 29
(E) 55
RBI Assistant Prelim Solved Paper 2016

8. There are some students in the class and number of candies received by each student is one-seventh of the total student in the class. If the number of student in the class becomes one-fifth then each students gets 25 candies. Find the total number of candies distributed in the class ?
(A) 177 (B) 175
(C) 196 (D) 174
(E) 198
IBPS Clerk Preliminary Solved Paper 2016

Bank PO

9. M, N and O are three consecutive odd numbers in ascending order. If the value of three times M is 3 less then two times O, find the value of O.
(A) 11 (B) 7
(C) 5 (D) 9
(E) 12
[RRB PO Pre 2020]

10. Let XYZ be *a* three-digit number, where (X + Y + Z) is not a multiple of 3. Then (XYZ + YZX + ZXY) is not divisible by :
(A) 3 (B) 9
(C) 37 (D) $x + y + 21$
(E) 45
[RRB PO Pre 2019]

Type : 2
Dividend = Divisor × Quotient Remainder

Bank Clerk

11. Arka Pratap divides a certain number by 5, 7 and 8 successively, the remainders are 2, 3 and 4 respectively. What will be the remainder if the order of the division is reversed ?
(A) 6,5 and 2 (B) 5, 5 and 2
(C) 4, 5 and 2 (D) 2, 5 and 4
(E) None of these
SBI Clerk (Junior Associates) Main Solved Paper 2019

12. When 3,626 is divided by the square of a number and the answer so obtained is multiplied by 32, the final answer obtained is 2,368. What is the number ?
(A) 7 (B) 36
(C) 49 (D) 6
(E) None of these
IBPS RRB office Assistant. (Math PurPose) Main Solved Paper 2018

Type : 3
Divisibility Rule

Bank Clerk

13. The digits of a three-digit number N are written in the reverse order to form another three-digit number M. If M > N and M-N is perfectly divisible by 7, then which of the following is necessarily true ?
(A) 106 < N < 305 (B) 100 < N < 299
(C) 118 < N < 317 (D) 112 < N < 311
(E) None of these
[RRB Assistant 2017]

Bank PO

14. Consider the following statements :
I. 7710312401 is divisible by 11.
II. 173 is a prime number.
Which of the statements given above is/are correct ?
(A) Only I (B) Only II
(C) Both I and II (D) Neither I nor II
(E) None of these
[RRB PO Pre Exam. 2020]

15. A six-digit number is formed by repeating a three-digit number; for example, 256, 256 or 678, 678 etc. Any number of this form is always exactly divisible by :
(A) 7 only (B) 11 only
(C) 13 only (D) 1001
(E) None of these
[IBPS PO Main Exam 2017]

Type : 4
Questions Based on Sum of Natural Numbers

Bank Clerk

16. If k and p are integers divisible by 5, which of the following is not necessarily true ?
(A) $k - p$ is divisible by 5
(B) $k^2 - p^2$ is divisible by 25
(C) $k + p$ is divisible by 10
(D) $k + p$ is divisible by 20
(E) None of these
[RRB Assistant 2019]

17. Let a, b and c be distinct integers, that a and b are odd and positive, and c is even and positive. Which one of the following statements cannot be true ?
(A) abc^2 is odd
(B) $(a - b)^2 c$ is even
(C) $(a - b)(b + c)(a + b - c)$ is odd
(D) $(a + b - c)(a + b)$ is even
(E) None of these
[SBI Clerk 2019]

18. Let a and b be positive integers such that a is prime and b is composite. Then,
(A) $b - a$ cannot be an even integer
(B) $(a + b)/a$ cannot be an even integer
(C) ab cannot be an even integer
(D) $(a + b)$ is an integer
(E) None of these
[SBI Clerk 2018]

19. If 6 marks are awarded to right answer and 3 marks penalty for wrong answer. Then Prabhat's score was 120. If he attempted 50 questions then find number of correctly attempted questions ?
(A) 30 (B) 42
(C) 48 (D) 35
(E) 38
IBPS Clerk Prelim Solved Paper 2018

20. Sum of 4 consecutive even numbers are greater than three consecutive odd numbers by 81. If sum of least odd and even number is 59, then find the sum of largest odd and even numbers.
(A) 69 (B) 71
(C) 73 (D) 67
(E) None of these
IBPS Clerk Prelim Solved Paper 2017

21. The difference between the sum of four consecutive odd numbers and three consecutive even numbers together is 20. Also, the largest even number is 5 more than the largest odd number. What is the sum of the smallest odd number and the smallest even number ?
(A) 77 (B) 71
(C) 879 (D) 83
(E) Cannot be determined
IBPS Clerk Main Solved Paper 2016

22. Pravin purchased 25 kg of rice at the rate ₹45 per kg and 12 kg of pulses at the rate of ₹28 per kg. What is the total amount that he paid to the shopkeeper ?
(A) ₹1,466 (B) ₹1,426
(C) ₹1,461 (D) ₹1,471
(E) None of these
SBI JA & JAA Bank Clerk Preliminry Solved Paper 2016

23. The sum of five consecutive numbers is 190. What is the sum of the largest and the smallest number ?
(A) 75 (B) 77
(C) 76 (D) 73
(E) None of these
SBI JA & JAA Bank Clerk Preliminary Solved Paper 2016

Type : 5
Remainder Theorem

Bank Clerk

24. The numbers 1 to 29 are written side by side as follows 1234567891011.....28 29. If the number is divided by 9, then what is the remainder ?
(A) 3 (B) 1
(C) 0 (D) 6
(E) None of these
[SBI Clerk 18-10-2023 Shift-1]

Type : 6
Questions Based on Number of Digits

Bank Clerk

25. What is the value of P ?
I. P and Q are unequal even integers, less than 10, and P/Q is an odd integers.
II. P and Q are even integers, each less than 10, and product of P and Q is 12.
(A) Only I
(B) Only II
(C) Either I or II
(D) Both together
(E) Neither I nor II together
[IBPS Clerk 2021]

26. If x and y are consecutive positive integers, such that $x < y$,
I. $(x + 1)(y - 1) = xy$
II. $(x + y)^2$ leaves a remainder of 1 when divided by 8.
(A) Only I
(B) Only II
(C) Either I or II alone
(D) Both together
(E) Neither I nor II together
[IBPS Clerk (Mains) 2021]

Bank PO

27. The ten's digit of a three digit number is 3. If the hundredth and unit digits are intercharged and the number thus formed is 396 more than the previous one. The sum of unit digit and hundred digit is 14, then what is the number?
(A) 480 (B) 539
(C) 593 (D) 935
(E) None of these
[IBPS Po Prelim Exam, 15-10-2017]
[IBPS Po (Pre), 07-10-2017]

Type : 7
Factorial Rule

Bank Clerk

28. The integers 1, 2 ....., 40 are written on a blackboard.
The following operation is then repeated 39 times. In each repetition, any two numbers, say a and b, currently on the blackboard are erased and a new number $a + b - 1$ is written. What will be the number left on the board at the end ?
(A) 820 (B) 821
(C) 781 (D) 819
(E) None of these
[SBI Clerk 2021]

Bank PO

29. Let N = 1! + 2! + 3! + 4! + ... + 200! Which one about N is true ?
(i) N is even (ii) N is odd
(iii) N/2 is odd
(A) Only (i) (B) Only (ii)
(C) Only (i) & (iii) (D) Only (iii)
(E) None of these
[IBPS PO Main Exam 2017]

Type : 8
Miscellaneous

Bank Clerk

30. If the numerator of a certain fraction is increased by 80%, while the denominator is increased by 200%, then the ratio of the numerator and denominator becomes 21 : 50, what will be the actual fraction?
(A) 5/7 (B) 7/8
(C) 7/10 (D) 8/11
(E) 5/8
SBI Clerk 19/11/22 Shift-1

31. The numerator of a fraction is decreased by 25% and the denominator is increased by 250%. If the resultant fraction is $\frac{6}{5}$, What is the original fraction ?

(A) $\frac{25}{5}$ (B) $\frac{24}{5}$

(C) $\frac{27}{6}$ (D) $\frac{28}{5}$

(E) $\frac{30}{11}$

IBPS Clerk Preliminary Solved Paper 2016

32. There are two integers 34041 and 32506, when divided by a three-digit integer n, leave the same remainder. What is the value of n ?

(A) 298 (B) 307

(C) 461 (D) 245

(E) can't be determined

[SBI Clerk 2020]

Bank PO

33. The question consists of two statements numbered "I" and "II" given below it. You have to decide whether the data provided in the statements are sufficient to answer the question or not and choose the correct option accordingly.

There are seven consecutive natural numbers. Find the average of the numbers.

Statement I: Second largest number is 62.5% more than the smallest number.

Statement II: Largest number is 6 more than the smallest number.

(A) The data in statement I alone is sufficient to answer, while the data in statement II alone is not sufficient to answer the question.

(B) The data in statement II alone is sufficient to answer, while the data in statement I alone is not sufficient to answer the question.

(C) The data either in statement I alone or in statement II alone are sufficient to answer the question.

(D) The data given in both statements I and II together are not sufficient to answer the question.

(E) The data in both statements I and II together are necessary to answer the question.

[RRB PO Pre. Exam, 06-08-2023 (Shift-4)]

34. When the digits of a two digit natural number are interchanged then original number is greater than four times the new number so obtained. How many such natural numbers satisfy the given condition ? Ignore the numbers which have '0' in their unit place.

(A) 2 (B) 3

(C) 5 (D) 6

(E) 7

[IBPS PO MAIN EXAM, 2018]

Direction (Q. No. 35 and 36)

Answer the question based on the information given below: Solve the given equations and answer the questions based on it.

A. $(a \times a) - 3a - \sqrt{(4a^2)} = -6$

B. $\left((b^2) - \sqrt{81b^2}\right) = -4 \times (5)$

C. $\left(c^2 \times \sqrt{625c^6}\right) / 5c^3 + (4 \times 7) = 39c$

D. $d^2 - (3 \times 5)d = \{7 \times (-8)\}$

[IBPS PO MAIN EXAM, 2022]

35. Find the LCM of all the larger roots of the equations A, B, C and D.

(A) 720 (B) 120

(C) 360 (D) 840

(E) None of these

36. In which of the given equation (s) the difference between larger root and smaller root is 1?

(A) Only B and D

(B) Only A and B

(C) Only A and D

(D) Only A, B and D

(E) All A, B, C and D

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Chapter

1

Number System

Solutions

1. (C) I. P is divided by 4, and remainder is 3.

$P = 4x + 3$

$x = 2$

$P = 8 + 3$

$P = 11$

And $x = 4$

$P = 16 + 3$

$P = 19$

Hence, this statement is not sufficient.

II. $4x + 3 = 7y + 2$

$4x - 7y = -1$

$4x = 4y + 3y - 1$

$4x - 4y = 3y - 1$

$x - y = \frac{3y-1}{4}$

Put, $y = 3$,

$x - 3 = \frac{9-1}{4}$

$x = 3 + 2 = 5$

$P = 23$

$y = 11$

$x = 11 + 8 = 19$

$P = 79$

Hence, combination also does not help.

2. (C) Let the three consecutive positive even integer be x, $x + 2$ and $x + 4$

ATQ,

$(3.x) - 2 = 2(x + 4)$

$3x - 2 = 2x + 8$

$3x - 2x = 10$

$x = 10$

Therefore, $x = 10$ and the other two integer are :

$x + 2 = 10 + 2 = 12$

And $x + 4 = 10 + 4 = 14$

Hence, the third number is 14.

3. (A) Let the numbers be the form $10x + y$

According to question,

$10x + y = x + y + xy$

$9x = xy$

$\therefore \quad y = 9$

The numbers are 19, 29, 39, 49, 59, 69, 79, 89 and 99 total to 9 numbers

Hence, the required fraction = $\frac{9}{91}$

$= 0.099 = 0.1$

4. (C) Let $10x + y$ be a two digit number, where x and y are positive single digit integers and $x > 0$

Its reverse = $10y + x$

Now, $10y + x - 10x - y = 18$

$9(y - x) = 18$

$y - x = 2$

Thus y and x can be (1, 3), (2, 4), (3, 5), (4, 6), (5, 7), (6, 8) and (7, 9)

$\therefore$ Other than 13, there are 6 such numbers.

5. (A) Since mn is a two digit Prime numbers and one of its digit is 3.

It can let any of the value's among 13, 23, 31, 37, 43, 53, 73 and 83.

Difference between the digits of the number is not a factor of 2.

Number that satisfy the aforementioned. condition are 37, 73 and 83.

Hence, the number of values that mn is 3.

6. (C) Consider the number as x.

A.T.Q.

$\Rightarrow \quad x \times \frac{3}{4}x = 10800$

$\Rightarrow \quad x^2 = 10800 \times \frac{4}{3} = 3600 \times 4$

$= 14400$

$\therefore \quad x = \sqrt{14400} = 120$

7. (A) $\frac{3}{4}$ of $52 = 52 \times \frac{3}{4} = 39$

$\frac{2}{3}$ of $99 = 99 \times \frac{2}{3} = 66$

Hence, required value = $66 - 39 = 27$.

8. (B) Let the number of students in the class = x

According to question $x \times \frac{x}{7} = \frac{x}{5} \times 25$

$x = 35$

Hence, Required number of candies

$= \frac{35}{5} \times 25 = 175$

9. (D) Let M, N and O are three consecutive odd number are a, $a + 2$, $a + 4$ respectively.

ATQ,

$3a + 3 = 2a + 8$

$3a - 2a = 8 - 3$

$a = 5$

The value of O

$= a + 4$

$= 5 + 4 = a$

Hence, option (D) is correct.

10. (B) Number of XYZ

$= 100x + 10y + z$

Number of YZX

$= 100y + 10z + x$

Number of ZXY

$= 100z + 10x + y$

XYZ + YZX + ZXY

$100x + 10y + z + 100y + 10z + x + 100z + 10x + y$

$= 111x + 111y + 111z$

$= 111 (x + y + z)$

It is clear that 111 is the common factor.

So, XYZ + YZX + ZXY is divisible by 111.

Factor of 111 are 3 and 37.

But it is given that $(x + y + z)$ is not multiple of 3.

(XYZ + YZX + ZXY) is not divisible by 9.

11. (B) Let the certain number = N

According to question,

$N = 5 [7(8x + 4) + 3] + 2$

$= 35 (8x + 4) + 15 + 2$

$= 35 (8x) + 140 + 17 = 280x + 157$

When this is divided by 8, quotient = $35x + 19$ and remainder = 5

When $(35x + 19)$ is divided by 7, quotient = $5x + 2$ and remainder = 5

When $(5x + 2)$ is divided by 5, quotient = x and remainder = 2.

Then, required the remainder is 5, 5 and 2.

12. (A) Let the number be x.

A.T.Q.,

$$\frac{3626}{x^2} \times 32 = 2368$$

$$\Rightarrow \quad x^2 = \frac{3626 \times 32}{2368}$$

$$\Rightarrow \quad x^2 = \frac{116032}{2368}$$

$$\therefore \quad x = \sqrt{49} = 7$$

13. (A) Let N = xyz be a digit a number
Then N can be expressed as
$N = 100x + 10y + z$
And is reverse of x
$M = 100z + 10y + x$
$M - N = 100z + 10y + x - 100x - 10y - z$
$= 99z - 99x$
$= 99(z - x)$
As, M – N is divided by 7, and 99
$\therefore \quad (z - x) = 7$
Also x cannot be zero
$x = 1, 2$ and $z = 8, 9$
M – N = 99 × 7 = 693
Smallest value of N can be 108
Largest value of N can be 299
Corresponding value of M are
108 + 693 = 801
And 299 + 693 = 992
Thus 106 < A < 305 will be correct option.

14. (C) I. Any number in order to get completely divided by 11, the difference between the sum of even place digits and the sum of odd place digits must have equal to either 0 or the multiple of 11. In 7710312401, difference between sum of even place digits and the sum of odd place digit is 0. So, it is divisible by 11.
II. To check divisibility of 173, we can divide the number by all the prime numbers from 2 to 13. It is not divisible by 2, 3, 5, 7, 11 and 13. So, it is a prime number. Hence, both statements I and II are correct.

15. (D) Let the three digit number be abc
then 6 digit number $abcabc$
$= 100000a + 10000b + 1000c + 100a + 10b + c$
$= 100100a + 10010b + 1001c$
$= 1(100a + 10b + c)1001$
So, this number will be always divisible by 1001 and its factors.
$1001 = 7 \times 11 \times 13$
Hence, divisible by 7, 11, 13, 77, 91, 143 and 1001.

16. (C) If k and p are integers divisible by 5
Let, $k = 15$ and 20
Then each one of k and p is divisible by 5.
But $(k + p)$ is not divisible by 10.
$\because$ $(k + p)$ is divisible by 10 is not true.

17. (A) Let, some suitable values for example
$a = 1, b = 3$ and $c = 2$
Now substitute in the options and check
Option (A)
abc^2 is odd
$= 1 \times 3 \times 2^2$
$= 1 \times 3 \times 4$
$= 12$ (even) (wrong)
Option (B)
$(a - b)^2 c$ is even
$= (1 - 3)^2 \times 2$
$= 4 \times 2$
$= 8$ (even) (correct)
Option (C)
$(a - b)(b + c)(a + b - c)$ is odd
$= (1 - 3)(3 + 2)(1 + 3 - 2)$
$= -2 \times 5 \times 2$
$= -20$ (even) (correct)
Option (D)
$(a + b - c)(a + b)$ is even
$= (1 + 3 - 2)(1 + 3)$
$= 2 \times 4$
$= 8$ even (correct)
Hence, option (A) is false.

18. (D) Choose one Prime number & one Composite number
Option (D) $(a + b)$ is an integer
Prime number = 2
And Composite number = 4
$\Rightarrow 2 + 4 = 6$ which is an integer.
option (D) is correct.
Option (C) ab cannot be an even integer. $2 \times 4 = 8$ is an even integer
Hence, Option (C) is wrong.
Option (B) : $\frac{a+b}{a}$

$= \frac{2+6}{2} = 4$ which is an even integer

Option (B) is wrong.
Option (B) : $(b - a)$
$(6 - 2) = 4$ which is an even integer
Option (A) is wrong.

19. (A) Let number of correct questions = x
Then, Incorrect questions = $(50 - x)$
ATQ,
$\Rightarrow \quad x \times 6 - (50 - x) \times 3 = 120$
$\Rightarrow \quad 6x - (150 - 3x) = 120$
$\Rightarrow \quad 6x - 150 + 3x = 120$
$\Rightarrow \quad 9x = 270$
$\Rightarrow \quad x = 30$
So number of correctly atttempted question of prabhat is 30.

20. (A) Let the least even number be x.
Then,4 consecutive even numbers be $x, x + 2, x + 4$ and $+ 6$ respectively.
Let, least odd number be y
Then, 3 consecutive odd numbers be $y, y + 2$ and $y + 4$
A.T.Q.,
$\Rightarrow [x + (x + 2) + (x + 4) + (x + 6)] - [y + (y + 2) + (y + 4)] = 81$
$\Rightarrow 4x + 12 - 3y - 6 = 81$
$\Rightarrow 4x - 3y = 81 - 12 + 6$
$\Rightarrow 4x - 3y = 75$ ...(i)
Now, sum of smallest even and odd numbers $(x + y) = 59$ ...(ii)
Solving equation (i) and (ii), we get $x = 36, y = 23$
Now sum of largest even number and largest odd number = $(x + 6) + (y + 4) = (36 + 6) + (23 + 4) = 42 + 27 = 69$

21. (A) Consider the odd numbers as $x, x + 2, x + 4, x + 6$ and the even numbers as $y, y + 2, y + 4$.
A.T.Q., $(4x + 12) - (3y + 6) = 20$
And $(y + 4) - (x + 6) = 5$
$\therefore \quad 4x - 3y = 14$ ...(i)
and $\quad -x + y = 7$ ...(ii)
Solving eqn. (i) and (ii), we get $x = 35$ and $y = 42$
Required sum = 35 + 42 = 77

22. (C) Total amount paid = Total price of rice + Total price of pulses = ₹ $(25 \times 45 + 12 \times 28)$
= ₹ (1125 + 336)
= ₹1,461

23. (C) Consider the lowest number as x.
A.T.Q.,
$x + (x + 1) + (x + 2) + (x + 3) + (x + 4) = 190$

$$\Rightarrow \quad x = \frac{190 - 10}{5} = 36$$

$\therefore$ Required sum = $x + x + 4$
$= 36 + 40 = 76$

24. (A) Sum of the digit of the number
= 1 + 2 + 3 + 4 + ... up to last digit
= 45 × 3 + 30 = 165
165 when divided by 9 leave remainder 3.

25. (B) I. P and Q are unequal even integer. P and Q can be among 2, 4, 6 and 8. It is given that P/Q is an odd integer. So, P must be greater than Q.
If we take different pair of (P, Q) among (8, 2), (8, 4), (8, 6), (6, 2), (6, 4), (4, 2) only (6, 2) satisfies the above condition of P/Q being an odd integer.
So, we can uniquely determine the values of P and Q which are 6 and 2 respectively.
II. The product of two even number, the possible is when the numbers are 2 and 6.
However we don't know any relation between P and Q.

26. (D) I. $(x + y)(y - 1) = xy$
$xy - x + y - 1 = xy$

$-x + y - 1 = 0$

$y - x = 1$

$y = x + 1$

Since x and y are consecutive positive integers and $x < y$ then $y = x + 1$ is true

II. $(x + y)^2$ leaves a remainder of 1 when divided by 8.

Since x and y are consecutive positive integers, one of them can be written as $2k$ and the other as C $2k + 1$ for some positive integer k

Therefore,

$x + y = 4k + 1$

$(x + y)^2 = (4k + 1)^2$

$= 16k^2 + 1 + 2 \times 4k \times 1$

$= 16k^2 + 8k + 1$

Since $16k^2 + 8k$ are multiple of 8.

We see that $(x + y)^2$ does leaves a remainder of 1 when divided by 8 ?

Statement I and Statement II are correct.

27. (B) Let digit be abc

Also, $b = 3$

So, according to question,

$(100c + 10b + a) - (100a + 10b + c)$

$= 396$

$99c - 99a = 396$

$c + a = 4$ ...(i)

And it is given that

$c - a = 14$ ...(ii)

Solving (i) and (ii)

$c = 9$

$a = 5$

so, required number = 539

28. (C) $1 + 2 + 3 + ... + 40 = \dfrac{40 \times 41}{2} = 820$

Since each time any two numbers a and b are erased and a single new number $(a + b - 1)$ is writen. Hence, each one is subtracted and this process is repeated 39 time. Therefore, number left on the board at the end = 820 – 39 = 781.

29. (B) Since all the factorials except 1! Is even number hence required summation must be odd.

30. (C) let numerator of the fraction is x and denominator is y

then fraction will be $\dfrac{x}{y}$

Numerator increased 80%

so new numerator would be

$$x + \frac{80 \times x}{100} = \frac{9x}{5} \quad ...(i)$$

new denominator will be

$$y + \frac{200 \times y}{100} = 3y \quad ...(ii)$$

ATQ, we have

$$\Rightarrow \quad \frac{\frac{9x}{5}}{3y} = \frac{21}{50}$$

$$\Rightarrow \quad \frac{9x}{5 \times 3y} = \frac{21}{50}$$

$$\frac{3x}{5y} = \frac{21}{50}$$

$$\Rightarrow \quad \frac{x}{y} = \frac{7}{10}$$

So, original fraction is $\dfrac{7}{10}$.

31. (D) Let the original fraction be $x : y$

ATQ,

$$\frac{x - \frac{25x}{100}}{y + \frac{250y}{100}} = \frac{6}{5}$$

$$\Rightarrow \quad \frac{\frac{75x}{100}}{\frac{350y}{100}} = \frac{6}{5}$$

$$\Rightarrow \quad \frac{75x}{350y} = \frac{6}{5}$$

$$\Rightarrow \quad \frac{15x}{70y} = \frac{6}{5}$$

$$\Rightarrow \quad \frac{x}{y} = \frac{420}{75}$$

$$\Rightarrow \quad \frac{x}{y} = \frac{28}{5}$$

So, $\dfrac{28}{5}$ is the original fraction

32. (B) Let the common remainder be x. Then numbers $(34041 - x)$ and $(32506 - x)$ would be completely divisible by n.

Hence, the difference of the numbers $(34041 - x)$ and $(32506 - x)$ will also be divisible by n

or $(34041 - x - 32506 + x) = 1535$ will also be divisible by n.

Now, using options we find that 1535 is divisible by 307.

33. (A) Let 7 consecutive natural number be $x, x + 1, x + 2, x + 3, x + 4, x + 5, x + 6$

According to statement-I:

$$\therefore \quad \frac{x \times 162.5}{100} = x + 5$$

$162.5x = 100x + 500$

$x = 8$

$\therefore$ Statement-I is alone sufficient to answer, while the data in statement-II alone is not sufficient to answer the question.

34. (B) Let the digits of two digit number be x and y.

The number $= 10x + y$

And reverse number $= 10y + x$

According to given condition,

$(10x + y) > 4(10y + x)$

$10x + y - 40y - 4x = 0$

$6x - 39y > 0$

If we substitute y for 1, then the possible value of x is equal to or more than 7 *i.e.* 7, 8 and 9

Therefore 3 numbers are possible when y is 1 *i.e.*, (71), (81), (91)

Values greater than 1 are not possi-ble for y. So there are 3 possible numbers.

35. (D) A. $(a \times a) - 3a - \sqrt{4a^2} = -6$

$a^2 - 3a - 2a + 6 = 0$

$a^2 - 5a + 6 = 0$

$(a - 3)(a - 2) = 0$

$a = 3$ and 2

B. $b^2 - \sqrt{81b^2} = -4 \times 5$

$b^2 - 9b + 20 = 0$

$(b - 5)(b - 4) = 0$

$b = 5$ and 4

C. $\dfrac{c^2\sqrt{625c^6}}{5c^3} + (4 \times 7) = 39c$

$\dfrac{c^2 \times 25c^3}{5c^3} + 28 = 39c$

$5c^2 - 39c + 28 = 0$

$5c^2 - 35c - 4c + 28 = 0$

$5c(c - 7) - 4(c - 7) = 0$

$(5c - 4)(c - 7) = 0$

$c = 0.8$ and 7

D. $d^2 - (3 \times 5)d = 7 \times (-8)$

$d^2 - 15d + 56 = 0$

$(d - 8)(d - 7) = 56$

$d = 8$ and 7.

Larger roots of A, B, C and D are 3, 5, 7 and 8 respectively.

there, LCM of 3, 5, 7 and $8 = 3 \times 5 \times 7 \times 8 = 840$

36. (D) Difference in roots in

A = 3 – 2

= 1

Difference in roots in

B = 5 – 4

= 1

Difference in roots in

C = 7 – 0.8

= 6.2

Difference in roots in

D = 8 – 7

= 1

Therefore, Only A, B and D has difference of 1.

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