1. Dinalal divides his property among his four sons after donating Rs.20,000 and 10% of his remaining property. The amounts received by the last three sons are in arithmetic progression and the amount received by the fourth son is equal to the total amount donated. The first son receives as his share RS.20,000 more than the share of the second son. The last son received RS.1 lakh less than the eldest son. 10. Find the share of the third son.
   a) Rs.80,000
   b) Rs.1,00,000
   c) Rs.1,20,000
   d) Rs.1,50,000
   Ans: Assume the amounts received by the 2nd, 3rd, and 4th sons are a+d, a, a-d (as they are in AP)
   Now Eldest son received Rs.20,000 more than the 2nd son. So He gets a+d+20,000
   Last son received 1 lakh less than the eldest son. So (a+d+20,000) - (a-d) = 1,00,000 ⇒ 2d = 80,000 ⇒ d = 40,000
   So Amounts received by the 4 sons are a + 60,000, a+40,000, a, a - 40,000
   It was given that the youngest son's share is equal to 20,000 + $\frac{1}{2}$(His property)
   Assume His property = K rupees.
   Then 20,000 + $\frac{1}{2}$(K) = a - 40,000 .....(1)
   and the Remaining property = Sum of the properties received by all the four son's together.
   Remaining property = $\frac{9}{10}$(K-20,000)
   ⇒$\frac{9}{10}$(K-20,000) = (a + 60,000) + (a+40,000) + a +(a - 40,000) ..(2)
   Solving We get K = 40,000 and a = 1,20,000
   So third son got Rs.1,20,000

   In a quadratic equation, (whose coefficients are not necessarily real) the constant term is not 0. The cube of the sum of the squares of its roots is equal to the square of the sum of the cubes of its roots. Which of the following is true?
   a)Both roots are real
   b) Neither of the roots is real
   c) At least one root is non-real
   d)At least one root is real
   Ans: Assume the given quadratic equation is $ax^2+bx+c=0$ whose roots are p, q.
   Now given that $(\alpha^2+\beta^2)^3=(\alpha^3+\beta^3)^2$
   By expanding we get, $\alpha^6+3.\alpha^4.\beta^2+3.\alpha^2.\beta^4+\beta^6=\alpha^6+\beta^6+2.\alpha^3.\beta^3$
   $3.\alpha^2.\beta^2(\alpha^2+\beta^2)=2.\alpha^3.\beta^3$
   $3.(\alpha^2+\beta^2)=2.\alpha.\beta$
   $3.(\alpha^2+\beta^2)+6.\alpha.\beta-6.\alpha.\beta=2.\alpha.\beta$
   $3.(\alpha+\beta)^2=8.\alpha.\beta$ ...(1)
   We know that sum of the roots = $\alpha+\beta=-\frac{b}{a}$
   product of the roots = $\alpha.\beta=\frac{c}{a}$
   Substituting in the equation (1) we get $3.(-\frac{b}{a})^2=8.\frac{c}{a}\Rightarrow 3.b^2=8.a.c$

   The nature of the roots can be determined by finding the magnitude of the determinant
   = b^2-4ac
   But we know that ac = $\frac{3b^2}{8}$
   So b^2-4ac = $b^2-4.\frac{3b^2}{8}=-\frac{b^8}{8}<0$
   So the roots are imaginary.

   3. A man sold 12 candies in 10$ had loss of b% then again sold 12 candies at 12$ had profit of b% find the value of b.

Ans: Here 12 candies is immaterial.
Loss % = $\frac{CP-SP}{CP}\times 100$
So Here SP = 10 and loss% = b%

$\frac{CP-10}{CP}\times 100=b \Rightarrow \frac{CP-10}{CP}=\frac{b}{100}$

In the second case he got a profit of b%

So Profit % = $\frac{SP-CP}{CP}\times 100$

So Here SP = 12 and profit% = b%

$\frac{12-CP}{CP}\times 100=b \Rightarrow \frac{12-CP}{CP}=\frac{b}{100}$

Solving 1 and 2 we get b = 1/11 or 9.09%

4. find the total number of combinations of 5 letters a,b,a,b,b taking some or all at a time?
Ans: 1 letter can be chosen in 2 ways. a or b
2 letters can be chosen in 3 way. aa, ab, bb
3 letters can be chosen in 3 ways. bbb, aab, bba
4 letters can be chosen in 2 ways. aabb, bbba
5 letters can be chosen in 1 way.
So total ways are 11

5. what is the sum of all the 4 digit numbers that can be formed using all of the digits 2,3,5 and 7?
Ans: use formula (n-1)! x (111..n times) x (Sum of the digits)
here n is number of different letters
So answer is 3 ! x 1111 x 17

6. 30^72^87 divided by 11 gives remainder
Ans: Fermat little theorem says, $a^{p-1}p$ remainder is 1.
ie., 30^{10} or $8^{10}$when divided by 11 remainder is 1.
The unit digit of 72^{87} is 8 (using cyclicity of unit digits) Click here
So 72^{87} = 10K + 8
$30^{(10K+8)}11=(30^{10})^K.30^811=1^k.30^811$
$8^811=2^{24}11=(2^5)^4.2^411=1611=5$

7. 1234567891011121314151617181920.....424344 what is remainder when divided by 45?
Ans: Let N = 1234567891011121314151617181920.....424344
Remainder when N is divided by 5 is 4. So N = 5K + 4 .....(1)
Remainder when N is divided by 9 is Sum of the digits of N divided by 9. We know that 1+2+3+...44 = 990 Which gives digit sum as 9. So remainder when N is divided by 9 is 0.
So N = 9L .....(2)
Equation (1) and (2) we 9L = 5K + 4
For K = 1 this equation gets satisfied. So least possible number satisfies the condition is 9
So The general format of N = w(LCM of (9, 5)) + Least number satisfies the condition.
So N = w.45 + 9
When N is divided by 45, we get 9 as remainder.

2. 1. The wages of 24 men and 16 women amounts to Rs.11600 per day. Half the number of men and 37 women earn the same amount per day. What is the daily wage of a man?
Let the wage of a man is m and woman be w.
24m+16w=11600

12m+37w = 11600
Solving we get m = 350

2. The sum of three digits a number is 17. The sum of square of the digits is 109. If we substract 495 from the number, the number is reversed. Find the number.
Let the number be abc.
Then a + b + c= 17 .....(1)
$a^2+b^2+c^2=109$ .....(2)
100a+10b+c -495 = 100c+10b+a .....(3)
From 3, we get a - c = 5
So the possibilities for (a, c, b) are (6,1,10), (7,2,8), (8,3,6), (9,4,4)
From the above, (8,3,6) satisfies the condition.

3. A calculator has a key for squaring and another key for inverting. So if x is the displayed number, then pressing the square key will replace x by x^2 and pressing the invert key will replace x by 1/x. If initially the number displayed is 6 and one alternatively presses the invert and square key 16 times each, then the final number displayed (assuming no roundoff or overflow errors) will be
Evern number of inverse key has no effect on the number.
By pressing the square key, the value got increased like 2, 4, 8, ... Which are in the format of 2^n. So after the 16 pressings the power becomes 2^{16}
So the final number will be $6^{2^{16}}=6^{65536}$

4. How many two digit numbers are there which when substracted from the number formed by reversing it's digits as well as when added to the number formed by reversing its digits, result in a perfect square.
Let the number xy = 10x + y
Given that, 10x+y - (10y - x) = 9(x-y) is a perfect square
So x-y can be 1, 4, 9. -------- (1)
So given that 10x+y +(10y +x) = 11(x+y) is a perfect square.
So x+y be 11. Possible options are (9,2), (8,3),(7,4),(6,5) ---------(2)
From the above two conditions only (6,5) satisfies the condition
Only 1 number 56 satisfies.

5. Find the 55th word of SHUVANK in dictionary
Sol: Arranging the letters in alphabetical order we get : A H K N S U V
Now Total words start with A are 6!
Total words start with AH are 5! = 120
Now
Total words start with AHK are 4! = 24
Total words start with AHN are 4! = 24
Total words start with AHSK are 3! = 6
Now AHSNKUV will be the last word required.

6. Car A leaves city C at 5pm and is driven at a speed of 40kmph. 2 hours later another car B leaves city C and is driven in the same direction as car A. In how much time will car B be 9 kms ahead of car A if the speed of car is 60kmph
Relative speed = 60 - 40 = 20 kmph
Initial gap as car B leaves after 2 hours = 40 x 2 = 80 kms
Car B should be 9 km ahead of the A at a required time so it must be 89 km away
Time = 89 / 20 = 4.45 hrs or 267 mins

7. Find the average of the terms in the series 1-2+3-4+5....+199-200
Sol:(1-2) +(3-4) + (5-6) +.....(199-200) = -100
Average = 100 / 200 = -0.5

8. n is a natural number and n^3 has 16 factors. Then how many factors can n^4 have?
Total factors of a number $N=a^p.b^q.c^r...$ is (p+1)(q+1)(r+1)...
As n^3 has 16 factors n^3 can be one of the two formats given below
$n^3 = a^{15}$
$n^3 = a^3.b^3$
If $n^3 = a^{15}$ then $n = a^5$ and number of factors of n^4 = 21
$n^3 = a^3.b^3$ then n = ab and number of factors n^4 = 25

9. Two cars start from the same point at the same time towards the same destination which is 420 km away. The first and second car travel at respective speeds of 60 kmph and 90 kmph. After travelling for sometime the speeds of the two cars get interchanged. Finally the second car reaches the destination one hour earlier than the first. Find the time after which the speeds get interchanged?
Let the total time taken by the cars be a and b
Let the time after which the speed is interchanged be t
For car A, 60t+90(a-t) = 420, 90a - 30t = 420 .....(1)
For car B, 90t + 60(b-t) = 420, 60b + 30t = 420 ....(2)
Using both (1) and (2), we get 90a + 60b = 840
But as a - b =1, 90a + 60(a-1) = 840.
Solving a = 6.
Substituting in equation 1, we get t = 4

10 1. A and B run a 1 km race. If A gives B a start of 50m, A wins by 14 seconds and if A gives B a start of 22 seconds, B wins by 20 meters. Find the time taken by A to run 1 km.
To solve these type of questions, always keep in your mind that, the ratio of the speeds of two contestents never change.
A gives B a start of 50 m means, A runs 1000 m and B runs only 950. By the time A reaches the target, B has to take 22 seconds to reach the target.
$ab = 1000950 - 14b = 9801000 - 22b$
50,000 -1100b = 46550 -686b
Solving we get b = 25/3
Now Assume A's speed = x
$1000950 - 14(25/3) = x25/3$
x = 10
So x takes 1000/10 = 100 seconds.

11. A owes B Rs.50. He agrees to pay B over a number of consecutive days on a Monday, paying single note or Rs.10 or Rs.20 on each day. In how many different ways can A repay B.
He can pay by all 10 rupee notes = 1 way
3 Ten rupee + 1 twenty rupee = $4!3! \times 1!$ = 4 ways
1 Ten rupee + 2 twenty rupee notes = $3!2! \times 1!$ = 3 ways
Total ways = 1 + 4 + 3 = 8

12. W, X, Y, Z are integers. The expression X - Y - Z is even and the expression Y - Z - W is odd. If X is even what must be true?
a) W must be odd
b) Y - Z must be odd
c) Z must be even
d) Z must be odd
Sol: X is even so Y, Z both are even or both are odd.
Now Y - Z in both cases even. So (Y - Z) - W = odd happens only when w is odd
Ans: W is odd

13. Raj writes a number. He sees that the number of two digits exceeds four times the sum of its digits by 3. If the number is increased by 18, the results is the same as the number formed by reversing the digits. Find the next immediate prime greater than the number.
Let the number be xy = 10x + y
10x + y = 4(x+y) + 3 ⇒ 2x - y -1 -------(1)
Also 10x + y +18 = 10y +x , 9(y-x) = 18, y-x = 2 -------(2)
Solving we get x = 3, y = 5
The number is 35. So next immediate prime is 37

14. Kate wanted to buy 2kgs of apples. The vendor kept the 2kg weight on the right side and weighed 4 apples for that. She doubted on the correctness of the balance and placed 2 kg weight on the left side and she could weight 14 apples for 2 kgs. If the balance was correct how many apples she would have got?
As she got less apples when the weight put on the right side, the left pan has more weight say w kgs.
Now w + 4a = 2
and w+ 2 = 14a
Solving we get a = 2/9 Kgs.
So she gets, 2/(2/9) = 9 apples

15. Find the remainder when 32^33^34 is divided by 11
We know that when the divisor is a prime number, Fermat little theorem says, a^{p-1} when divided by p, remainder is 1
So 32^{10} gives remainder 1.
Now we have to write 32^33^34 in this format. So we have to find the remainder 33^34 when divided by 10. The remainder is nothig but unit digit of the number. Click here to learn this concept
33^34 gives unit digit of 9.
So 33^34 = 10 K + 9
$32^{33^{34}}=32^{(10K+9)}=(32^{10})^K.32^9$
Now this expression when divided by 11 leaves a remainder of 32^9 which inturn is equal to $(-1)^9=-1=10$

16. Find the option to replace the question mark in the series below
5 ? 15 75 525 4725
Sol: 5 x 1 = 5
5 x 3 = 15
15 x 5 = 75
75 x 7 = 525
525 x 9 = 4725
So ? = 5

17. There are several bags of same weight. A bag is 6 kgs plus three fourth of the weight of an other bag. What is the weight of a bag?
Let the bags weight is x
Then 6 + $\frac{3}{4}$ x = x,
Solving we get x = 24

18. Find the remainder when 6^50 is divided by 215
Ans: $6^{50}=(6^3)^{16}.6^2=216^{16}.6^2$
So this expression gives a remainder of 36

19. Find last two digits of the following expression (201*202*203*204*246*247*248*249)^2
To find the last two digits of a product take the last two digits in each number and

multiply. 01*02*03.....48*49 (use onscreen calculator)
this gives 76. So 76^2 = 576 So last two digits are 76

19. Ahmed, Babu, Chitra, David and Eesha each choose a large different number. Ahmed says, " My number is not the largest and not the smallest". Babu says, "My number is not the largest and not the smallest". Chitra says, "My number is the largest". David says, " My number is the smallest". Eesha says, " My number is not the smallest". Exactly one of the five children is lying. The others are telling the truth. Who has the largest number?

a) Eesha
b) David
c) Chitra
d) Babu

Ans: A

Largest ->	A	B	C	D	E
A	F	T/F	T/F	T/F	T/F
B	T/F	F	T/F	T/F	T/F
C	F	F	T	F	F
D	T/F	T/F	T/F	F	T/F
E	T/F	T/F	T/F	T/F	T

From the above table, If we assume that A has the largest then A and C both are lying. Similarly if we find the truthfullness of the remaining people, it is clear that E has the largest and C lied. (Only one F in the last column)

20. In the equation A + B + C + D + E = FG where FG is the two digit number whose value is 10F + G and letters A, B , C , D , E, F and G each represent different digits. If FG is as large as possible. What is the value of G?

a) 4
b) 2
c) 1
d) 3

Ans: B

FG is as large as possible and all the 7 numbers should be different.
By trial and Error method,
9 + 8 + 7 + 6 + 5 = 35…5 is getting repeated twice.
9 + 8 + 7 + 6 + 4 = 34…4 is getting repeated
9 + 8 + 7 + 5 + 4 = 33…3 repeats
9 + 8 + 6 + 5 + 4 = 32
None of the numbers repeat in the above case and 32 is the maximum number FG can have. The value of G is 2.

21. A farmer has a rose garden. Every day he either plucks 7 or 6 or 24 or 23 roses. The rose plants are intelligent and when the farmer plucks these numbers of roses, the next day 37 or 36 or 9 or 18 new roses bloom in the garden respectively. On Monday, he counts 189 roses in the garden. He plucks the roses as per his plan on consecutive days and the new roses bloom as per intelligence of the plants mentioned above. After some days which of the following can be the number of roses in the garden?

a) 4

b) 7

c) 30

d) 37

Ans: A

If he plucks 23, then only 18 grows the next day. This means total roses get decreases by 5. So after n days assume the number of roses got decreased 185 where n = 37, then 4 roses left.

22. What is the value of (44444445*88888885*44444442+44444438)/44444444^2

a) 88888883

b) 88888884

c) 88888888

d) 44444443

Ans: A

Let x = 44444444

$(x+1)\times(2x-3)\times(x-2)+(x-6)x^2$

$(x^2-x-2)\times(2x-3)+(x-6)x^2$

$2x^3-2x^2-4x-3x^2+3x+6+x-6x^2$

$2x^3-5x^2x^2=2x-5$

Substituting the value of x in 2x - 5, we get 88888883

23. For which of the following "n" is the number 2^74 +2^2058+2^2n is a perfect square?

a) 2012

b) 2100

c) 2011

d) 2020

Ans: D

2^74 +2^2058+2^2n = K^2

2^74 +2^2058+2^2n = $(2^{37})^2+2^{2058}+(2^n)^2$

We try to write this expression as $(a+b)^2=a^2+2ab+b^2$

Now a = 2^{37}, 2ab = 2^{2058} and b = 2^n

Substituting the value of a in 2ab, we get b = 2020

24. Raj writes a number. He sees that the number of two digits exceeds four times the sum of its digit by 3. If the number is increased by 18, the result is the same as the number formed by reversing the digit. Find the number

a) 35

b) 57

c) 42
d) 49
Ans: A
Going by the options, 35 = 8(4) + 3.

25. Weight of M, D and I is 74. Sum of D and I is 46 greater than M. I is 60% less than D. What is D's weight.
Ans: 10
M + D + I = 74 ⇒ M = 74 -D - I
M = D + I + 46
I = $\frac{4}{10}$ D
74 - D - I = D + I + 46
74 - D - $\frac{4}{10}$ D = D + $\frac{4}{10}$ D + 46
⇒ D = 10

26. Father is 5 times faster than son. Father completes a work in 40 days before son. If both of them work together, when will the work get complete?
a. 8 days
b. 8 1/3 days
c. 10 days
d. 20 days
Ans: B
As efficiency is inversely proportional to days, If Father : son's efficiency is 5 : 1, then Days taken by them should be 1 : 5. Assume, the days taken by them are k, 5k.
Given that father takes 40 days less. So 5k - k = 40 ⇒ k = 10
Father takes 10 days to complete the work. Total work is 10 x 5 = 50 units.
If both of them work together, they complete 5 + 1 units a day. 6/day. To complete 50 units, they take 50/6 = 8 1/3 days.

27. A beaker contains 180 liters of alcohol. On 1st day, 60 l of alcohol is taken out and replaced by water. 2nd day, 60 l of mixture iss taken out and replaced by water and the process continues day after day. What will be the quantity of alcohol in beaker after 3 days
Ans: 53.3
Use the formula,
$$FinalAlcohol = InitialAlcohol\left(1 - \frac{Replacementquantity}{FinalVolume}\right)^n$$
$$FinalAlcohol = 180\left(1 - \frac{60}{180}\right)^3 = 180 \times \left(\frac{2}{3}\right)^3 = 53.3$$

28. If f(f(n)) + f(n) = 2n+3, f(0) = 1 then f(2012) = ?
Ans: 2013
f (f(0)) + f(0) = 2(0) + 3 ⇒ f(1) = 3-1 = 2, f(1) = 2
f(f(1)) + f(1) = 2(1) + 3 ⇒ f(2) = 5-2 = 3, f(2) = 3
f(f(2)) + f(2) = 2(2) + 3 ⇒ f(3) = 7-3 = 4, f(3) = 4
.....
f(2012) = 2013

29. What will be in the next series

1, 7, 8, 49, 56, 57, 343, ...

Ans: 344

1 = 1

7 = 1 x 7

8 = 1 x 7 + 1

49 = 7 x 7 + 1

50 = 7 x 7 + 1

56 = 8 x 7

57 = 8 x 7 + 1

343 = 49 x 7

Next term should be 49 x 7 + 1 = 344

30. In a 3 x 3 grid, comprising 9 tiles can be painted in red or blue. When tile is rotated by 180 degrees, there is no difference which can be spotted. How many such possibilities are there?

a. 16

b. 32

c. 64

d. 256

Ans: B

2	3	1
4	5	4
1	3	2

This grid even rotated 180 degrees the relative positions of the tiles do not change. So we paint tile number 1's with red or blue (only one color should be used) , 2's with red or blue.....tile 5 red or blue. Then total possibilities are $2^5 = 32$

31. In a staircase, there ar 10 steps. A child is attempting to climb the staircase. Each time she can either make 1 step or 2 steps. In how many different ways can she climb the staricase?

a) 10

b) 21

c) 36

d) None of these

Ans: d

Use fibonnacci series, with starting two terms as 1, 2. So next terms are 3, 5, 8, 13, 21, 34, 55, 89

32. A boy buys 18 sharpners, (Brown/white) for Rs.100. For every white sharpener, he pays one rupee more than the brown sharpener. What is the cost of white sharpener and how much did he buy?

a) 5, 13

b) 5, 10

c) 6, 10

d) None of these

Ans: C

Assume that he bought b, brown sharpeners and w, white sharpeners and the cost of brown sharpener is x and white sharpener is x + 1

So w(x+1) + bx = 100

w + b = 18

b = 18 - w

Substituting in equation 1, we get w(x+1) + (18 -w)x = 100 so w + 18 x = 100

Take option 1: If white sharpners are 13, x = (100 - 13) /18 = 4.833
Option 2, If white sharpeners are 10, x = (100 - 10)/18 = 5 So white sharpeners cost is 6.
Option 3 Satisfies this condition.

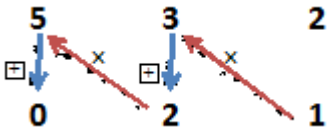
33. Letters of alphabets no from 1 to 26 are consecutively with 1 assigned to A and 26 to Z. By 27th letter we mean A, 28th B. In general 26m+n, m and n negative intezers is same as the letters numbered n.
Let P = 6, strange country military general sends this secret message according ot the following codification scheme. In codifying a sentence, the 1st time a letter occurs it is replaced by the pth letter from it. 2nd time if occurred it is replaced by P^2 letter from it. 3rd time it occurred it is replaced by p^3 letter from it. What is the code word for ABBATIAL
a) GHNNZOOR
b) GHKJZOHR
c) GHHGZOGR
d) GHLKZOIR
Ans: D
A should be coded as 1+6 = G (it occurred for first time)
B should be coded as 2+6 = H (it occurred for first time)
B Should be coded as 2 + 36 = 38 - 26 = 12 = L (it occurred for second time)
Option D is correct

34. Of a set of 30 numbers, average of 1st 10 numbers is equal to average of last 20 numbers. The sum of last 20 numbers is?
a) 2 x sum of last 10 numbers
b) 2 x sum of 1st 10 numbers
c) sum of 1st 10 numbers
d) Cannot be determined
Ans: B
Let average of first 10 numbers is a. Then sum = 10a
Average of last 10 nmbers also a. Then their sum = 20a
From the options B correct

35. In how many ways a team of 11 must be selected a team 5 men and 11 women such that the team must comprise of not more than 3 men.
a) 1565
b) 2256
c) 2456
d) 1243
Ans: B
Maximum 3 men can be played which means there can be 0, 1, 2, 3 men in the team.
$({}_5C_0 \times {}_{11}C_{11}) + ({}_5C_1 \times {}_{11}C_{10}) + ({}_5C_2 \times {}_{11}C_9) + ({}_5C_3 \times {}_{11}C_8) = 2256$

36. The wages of 24 men and 16 women amount to 11600 per day. Half the number of men and 37 women has same money. The daily wages paid to each man is
a) 375
b) 400
c) 350
d) 325
Ans: C
24m + 16w = 11600
12m + 37 w = 11600
Solving we get 12 m = 21w
Substituting in the first equation we get, 42w + 16 w = 11600 $\Rightarrow$ w = 200
M = 350

37. A number when successively divided by 5, 3, 2 gives remainder 0, 2, 1 respectively in that order. What will be the remainder when the same number is divided successively by 2, 3, 5 in that order
a) 4, 3, 2
b) 1, 0,4
c) 2, 1, 3
d) 4, 1, 2
Ans: B



use this simple technique.[(1 x 3) + 2] = 5
[(5 x 5) + 0] = 25

Procedure:

Let the number = N
Now N = 5K
K = 3L + 2
L = 2M + 1
K = 3(2M + 1) + 2 = 6M + 5
N = 5(6M + 5) = 30 M + 25
For M = 0 we get the least number as 25. Now when 25 is divided by 2, we get 12 as quotient and 1 as remainder. When 12 is divided by 3 we get 4 as quotient, and 0 as remainder. When 4 is divided by 5 we gt 4 as remainder.

38. a,b,c,d,e are distinct numbers. if (75-a)(75-b)(75-c)(75-d)(75-e)=2299 then a+b+c+d= ?
Hint:2299 is divisible by 11.
2299 = $11\times11\times19\times1\times1=11\times-11\times19\times-1\times1=$
Two of the terms in the given expression should equal to 1. As all the digits are distinct, two of the terms should be negative.
One possible solution = (75 - 64)(75 - 56)(75 - 86)(75 - 74)(75 - 76)
Then a + b + c + d + e = 64 + 56 + 86 + 74 + 76 = 356
But as the sum of only 4 terms was asked, we have to subtract one term.
So given answer can be one of 292, 306, 270, 282, 280

39. If A ^B means A raised to the power of B, in which of the following choices must P be greater than Q
a) 0.9^P=0.9^Q
b) 0.9^P=0.92^Q
c) 0.9^P>0.9^q
Option A is wrong as P = Q
Option B is wrong as $PQ=Log0.92Log0.9=0.79139$
Option C is also wrong as $a^P>a^Q$ then P>Q if a > 1

40. 2 gears one with 12 teeth and other one with 14 teeth are engaged with each other. One teeth in smaller and one tooth in bigger are marked and initially those 2 marked teeth are in contact with each other. After how many rotations of the smaller gear with the marked teeth in the other gear will again come into contact for the first time?

a)7

b) 12

c) Data insufficient

d) 84

Correct Option : A

Assume the distance between the teeth is 1 cm. Then the circumference of first gear is 12 cm and the second is 14 cm.

Now LCM (12, 14) = 84. So to cover 84 cm, the first gear has to rotate $\frac{84}{12}$ = 7 rounds (the second gear rotates 84 / 14 = 6 rounds as it is bigger)