

TCS Digital Advanced Quantitative Aptitude Questions

- 1) Advanced: In how many ways can we give change for rs 100 using 1 rupee and 2 rupee coins? For example for 5 rs we can give three ways

(1,1,1,1) (1,1,1,2) (1,2,2)

Answer: 51

- 2) Advanced: a, b, c are positive numbers such that $a+b+ab=8$, $b+c+bc=15$ and $c+a+ca=35$

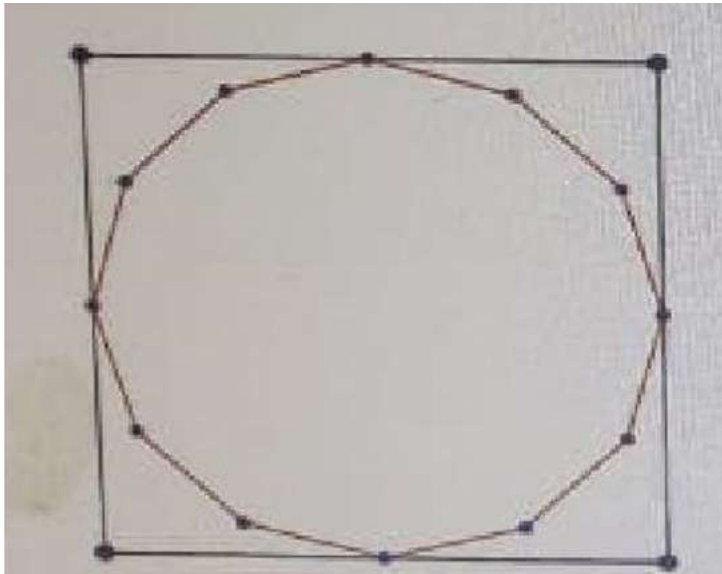
What is the value of $a+b+c+abc$?

Answer: 36

- 3) Advanced: It is possible to pair up all the numbers from 1 to 70 so that the positive difference of the numbers in each pair is always the same. For example, one such pairing up is (1,2), (3,4), (5,6), ..., (69,70). Here the common difference is 1. What is the sum of all such common differences.

Answer: 1680

- 4) 9. Advanced: A regular polygon with 12 sides (dodecagon) is inscribed in a square of area 24 square units as shown in the figure where four of the vertices are mid points of the sides of the square. The area of the dodecagon in square units is.



Answer: 19.26

- 5) In how many ways can we give change for 100 using 1 rupee and 2 rupee coins? For example for 5 rs, we can give in three ways : (1,1,1,1,1) (1,1,1,2) (1,2,2)

Answer: 51

- 6) Advanced: In the figure shown, a triangle is divided into nine stripes of equal height each parallel to the same side of the triangle. The shaded stripes have a total area of 135 square units. What is the area of the triangle in square units.



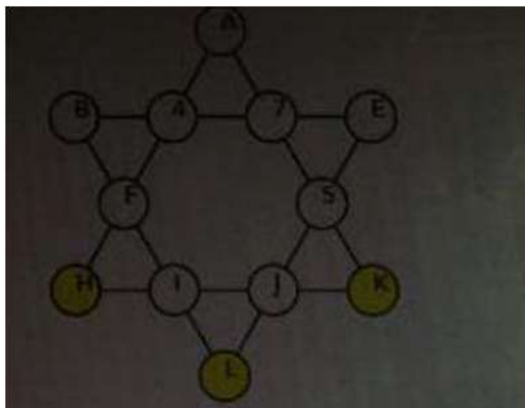
- 7) Advanced: The set $A(0)$ is $(1,2,3,4)$. For $n > 0$, $A(n+1)$ contains all possible sums that can be obtained by adding two different numbers from what is the number of integers in $A(10)$.

Answer: 67

- 8) Advanced What is the number of positive integers less than or equal to 2017 that have at least one pair of adjacent digits that are both even. For example 24,564 are two examples of such numbers while 1276 does not satisfy the required property.

Answer: 738

- 9) In the following star, the numbers on each straight line are in arithmetic progression. What is $H+K+L$?



- 10) Considering a hash table with 100 slots. Collisions are resolved using chaining. Assuming simple uniform hashing, what is the probability that the first 3 slots are unfilled after the first 3 insertions? (NOTE: 100^3 means 100 raised to the power 3)
- $(97 * 96 * 95) / 100^3$
 - $(97 * 96 * 95) / (6 * 100^3)$
 - $(97 * 97 * 97) / 100^3$
 - $(99 * 98 * 97) / 100^3$

Answer: $(97 * 97 * 97) / 100^3$

- 11) Advanced In this question x^y stands for x raised to the power y . for example $2^3=8$ and $4^{1.5}=8$

Find the number of positive integers $n > 2000$ which can be expressed as $n = 2^m + 2^n$ where m and n are integers (for example, $33 = 2^0 + 2^5$)

Answer: 65

12) Fishing is a serious environmental issue. It has been determined by the scientists that if the net of a trawler has mesh size x cm by x (square mesh) then the percentage of fish entering the net that are caught in the net is $(100 - 0.02x^2 - 0.05x)$. For example if the mesh size is zero 100% of the fish that enter the net will be caught. The trawler with net with a square mesh that was suspected of using an illegal size net dropped its net to the ocean floor near the damans and coast guard officials arrested the crew. The scientists later looked at the size of the fish caught and estimated that the net used by the trawler at least 97.93% of the fish entering the net would be caught. What is the maximum value of x for the net by the trawler?

- a. 8.5
- b. 9
- c. 11
- d. None of the answers

Answer: 9

13) In this problem $ABS(X)$ is the mathematical value of X without regard to its sign. For example $ABS(3)$ is 3 and $ABS(-3)$ is also 3. If the equation $ABS(x+12) + ABS(x-5) = r$ is satisfied by infinitely many values of x the value of r is

- a. 12
- b. No such r exists
- c. 17
- d. 5

14) One laser blast will break asteroids larger than 20 kg into three pieces, each one third of mass of the original. Asteroids 20 kg are shattered into dust by the laser. How many laser blasts would be required to reduce a 2000 kg asteroid to dust?

- ☐ 365
- ☐ 364
- ☐ 244
- ☐ 243

15) It is known that in the sequence A, X, B, C, D, Y, \dots the sum of any 3 consecutive terms is 19. The value of $A+B+C+D$ is

- ☐ 11
- ☐ None of these
- ☐ 21
- ☐ 30

16) A plane can be divided into 2 region by 1 line, 4 region by 2 line and 7 region by 3 line, How many maximum for 100 lines?

17) How many ways (m, n) pairs will solve this equation?

$$4^m = n^2 + 15 \quad (n - \text{positive integer})$$

18) Function :

$f(0)=1;$
 $f(2n)=f(n);$
 $f(2n+1)=f(n)+1;$
 $f(2018)=?$

19) $P(1 \text{ child}) = \frac{1}{4};$
 $P(2 \text{ child}) = \frac{1}{2};$
 $P(3 \text{ child}) = \frac{1}{4};$
 $P(4 \text{ grand children}) = ?$

21) $f(x) \geq 1$ for all x .

$F(2)=1$;

$F(3)=2$;

$F(5)=?$

22) There are four integers in the input ($N=4$).the number in the sequence are 1,2,3,4.

The sequence is in the increasing order and hence cannot have a down part of the sequence.and there is no maximal up and down subsequence, the result is 0.

Input:

4

-1,2,3,4

Output:

0

23) All the nonempty sets S of $\{1,2,3,4,5,6,7\}$,how many do not contain the number $[S]$,where $[S]$ denote the number of empty in S ? for example : $\{3,4\}$ is one such subset ,since it does not contain the number 2.

24) In the coding competition,four different functions were observed.all the function use a single "for" loop, and within the "for" loop,same set of statements are executed.Following are the loops:

for{ $i=0$; $i<0$; $i++$ }

A)for { $i=0$;

B)for{

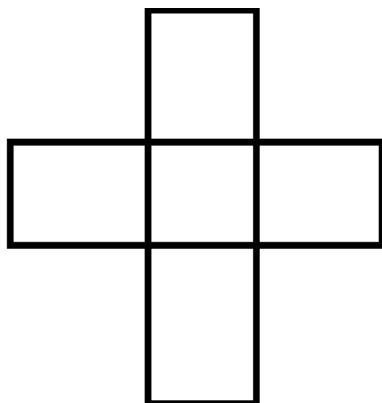
C)for{

D)for{

If N is the size of input (positive),which function is most efficient from the time point of view?

- ☐ A
- ☐ B
- ☐ C
- ☐ D

25) All the digits 2,4,7,8 and 9 are placed in the grid, one in each cell , to form two three digits numbers that are squares. Which digit is placed in the center of the grid?



- a)
- b)
- c)
- d)

26) The maximal up and down sequence is 1 5 4 3 2. this has 7 up and down sequence with the maximal element 5(the same as the maximal subsequence). these are
 1,5,4,3,2;1,5,4;1,5,3;1,5,2;1,5,4,3;1,5,4,2;1,5,3,2.

$N=5$

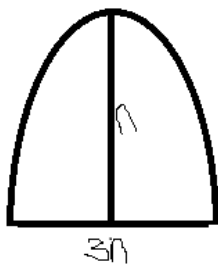
Input: 5

1,5,4,3,2

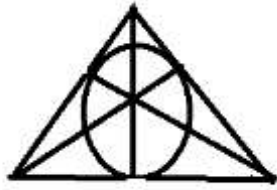
Output:7

27) Such that the radius is the positive integer.

Smallest $n = ?$



28) Same numbers of value in every segment?



29) TRUE OR FALSE

Arun ,Chandra ,bala were attended 6 questions.

Arun probability:TFFTTT

Chandra probability:FFTTTT

Bala probability:TTFFTT

A) Arun and bala had 5 questions corrected

B) So what is probability of Chandra getting true.

30) Sam walks total 6 steps.sam allowed to take 6 steps.either step forward or backward.each time probability for a step is $\frac{1}{2}$.

What is the probability of returning to the same position?

31) AGILITY:WALL HANGING DESIGN;

For function we should pass the base circle that is n value function should return the pattern; example:

N=3, 5pattern

N=5, 13pattern

32) If ($K < 250$) there is rooms with 4 walls.

if $n=2$ there is 8 walls, 3 is insufficient and 4 is sufficient?

33) value 1-9

Alphabet A-I QUESTION: $(A+I)+2*(B+G)+3*(C+F)+4*(D+H)+5*E$

$A < H < I < C$

$O > B > I > H > E$

$C < G < A$

$A > B > E > A$

34) if x, y, z, a, b, c are non zero numbers. $xyz(a+b)(b+c)(c+a)/abc(x+y)(y+z)(z+x)=?$

35) In the amusement park in the "LOONEY'S amusement, there is a weighted maze"

challenge, this consist of set of east west roads(left to right),north south roads(up and down roads).each intersection has a block of iron bar, the weight of which is given.

you enter the maze at the top left corner with 1 kg in the cart. the exit from the maze at the bottom right Corner. movement at any intersection is right or down provide a road exists in that direction. At each intersection you pass through,you must exchange your the weight in the cart with the weight of the bar,at the intersection,if it is havier than the weight you have in the cart.the object is to determine the path

through the maze is along the road so that one can exit the maze with the minimum weight in the cart. for example the maze shown, once can exit in the maze is 22kg

->1 8 21 7
19 17 10 20
2 18 22 23
14 25 4 13->

- 36) The greatest common divisor (gcd) of two positive integers is the largest positive integer that divides both integers without leaving a remainder. As 1 is an integer that always divides both integers, this always exists for any two numbers.

The one way of finding the gcd of two numbers is the Euclidean algorithm. This goes as follows.

- 1) Take the 2 integers say a, b
- 2) Find $\text{rem}(a, b)$ where $\text{rem}\{a, b\}$ is the remainder when a is divided by b
- 3) If $r = 0$, then $\text{gcd} = b$ terminate
- 4) $a = b, b = r$, create steps 2 to 4 until $r = 0$

for example, if we take 21, 9 as a, b the first iteration yields $r = 1$, in the second iteration, $a = 9, b = 3$, and $r = 0$. hence the gcd is 3.

Consider the set of polynomials whose coefficients are the integers modulo 13 ($0, 1, \dots, 12$). Multiplication and addition of the coefficients are done modulo 13. Examples are

$$X^3 + 11X^2 + 11X + 10$$
$$X^2 + 8X + 6$$

- 37) The following code given one part of a position paper on collaborative learning.

Please read the passage and identify which of the indicated technologies would be useful based on the passage. Note that more than one technology may be applicable.

Please write the appropriate technology labels (a, b and so on) separated by
In today's competitive market, it is not feasible to work without. While talent development is a set of integrated organizational HR collaborative learning is an educational approach that involves the biggest advantage of using collaborative learning as a means. The organizations are employing various methods of learning in. The best uses of collaborative learning empowered by Digital Social media is a useful tool for collaborative learning. Various digitized mechanisms, which can aid collaborative learning.

- 1) Publishing employee competence levels vis-à-vis peers, teams,
- 2) Creating award points to people who answer the queries of the
- 3) Creating a group as soon as people enroll for the course, where

- 38)

1, 7, 8, 49, 50, 56, 57, 343, 344, 350, 351, 392, 393, 399, 400,

The above sequence contains sums of distinct powers of 7 in the increasing order ($7^0, 7^1, 7^1 + 7^0, 7^2$ etc). What is the value of the term number 36?

168/15
16863
16857
16856

- 39) The length breadth and height of a room are in the ratio 3:2:1. If the breadth and height are halved while the length is doubled, then the total area of the four walls of the room will;
- Decreased by 15%
 - Decrease by 18.7%
 - Decrease by 13.6%
 - Decrease by 30%
- 40) A rectangle of height 100 squares and width 200 squares is drawn on a graph paper. It is coloured square by square from top left corner and moving across in a spiral turning right whenever a side of the rectangle or a coloured square is reached. Which square is coloured last? (give its row and column numbers – the bottom right square is on row 100 and column 200)
- 51,150
 - 50,150
 - 51,50
 - 50,50
- 41) How many 10-digits of strings of 0's and 1's are there that do not contain any consecutive 0's? _____
- 42) The number of integers n with $100 < n < 300$ such that 16 divides $(n^2 - n - 2)$ and 25 divides $(n^2 + 2n - 3)$ is ?
- 2
 - 1
 - 3
 - 4
- 43) A and B stand at distinct points of a circular race track of length 135m. They cycle at speed of a m/s and b m/s respectively. They meet for the first time 5 sec after the race and for the second time 14 sec from the time they start the race. Now, if B had started in the opposite direction to the one he had originally started, they would have met for the first time after 60 sec. If B is quicker than A, find b ?
- 7
 - 8
 - 6
 - 11
- 44) If 12 divided $ab313ab$ (in decimal notation, where a, b are digits > 0), the smallest value of $a + b$ is
- 2
 - 4
 - 7
 - 6
- 45) In a family, there are four daughters Aasha, Eesha, Trisha and Usha. Each girl has exactly one necklace and one bracelet. Each of these eight ornaments was bought in either 2007, 2008, 2009. The eight ornaments were bought in a manner consistent with the following conditions.
- The necklace for each girl was bought either in an earlier year than or in the same year as the bracelet for that girl.
 - The necklace for Eesha and the bracelet for Aasha were bought in the same year.

- The necklace for Trisha and the bracelet for Usha were bought in the same year.
- The necklace for Esha and the necklace for trisha were brought in different years.

- The necklace for aasha and the bracelet for trisha were bought in different years.
- The necklace for AAsha and the bracelet for Trisha were bought in 2008.

If the necklace for trisha was bought in an earlier year than the bracelet for trisha, was then which one of the following statement could be true?

- o The neckles for eesha was bought in 2007
- o The neckles for eesha was bought in 2008
- o The bracelet for usha was bought in 2008
- o The neckles for usha was bought in 2008

46) George's salary is 20% more than mark's ,harry's salary is 30% greater than george's.tony's salary is 40% more than alberts salary is 20% lessers than george's .what is albert's salary as a percentage of tony's salary (to the nearest percentage point)?

- 60%
- 76%
- 82%
- 69%

47) Of a set of 30 numbers, the average of the first 10 numbers is equal to the average of the last 20 numbers. The sums of the last 20 numbers is

- 2 X sum of last ten numbers
- Cannot be determine with the given data
- Sum of first ten numbers
- 2 X sum of first ten numbers

48) Each of A lia,Betty, Carol and Dalia took a test . Each them answered at least one question correctly, and together they answered 67 questions correctly. Alia had more correct answers than anyone else.Betty and carol together answered 43 questions correctly. how many correct answers did Dalia have ?_____

49) A Sudoku grid contains digit in such a manner that every row, every column and 3x3 box accommodates the digits 1 top 9, without repetition. In the following sudoko grid, find the values at the cells donated by

- o 59
- o 113
- o 79
- o 129

50) In a certain city, 60 percent of the registered voters are Party A supporters and the rest are Party B supporters. In an assembly election, if 75 percent of the registered Party A supporters and 20 percent of the registered Party B supporters are expected to vote for Candidate A, what percent of the registered voters are expected to vote for Candidate A?

- a. 53
- b. 20

- c. 60
- d. 75

51) Find the length of the longest pole that can be placed in an indoor stadium 24m long, 18m wide and 16m high.

- a. 34m
- b. 25m
- c. 36m
- d. 30m

52) If M is 30% of Q, Q is 20% of P, and N is 50% of P, then $M/N =$

- a. $3/250$
- b. $6/5$
- c. $4/3$
- d. $3/25$

53) In the question, A^B means A raised to the power B. If $f(x) = ax^4 - bx^2 + x + 5$ and $f(-3) = 2$, then $f(3) =$

- a. 3
- b. 8
- c. 1
- d. 2

54) $\frac{1}{4}$ of the tank contains fuel. When 11 liters of the fuel is poured into the tank, the indicator rest at the $\frac{1}{2}$ mark. Find the capacity of the tank liters.

- a. 36
- b. 44
- c. 8
- d. 6

55) You have been given a physical balance and 7 weight of 47,46,43,48,49,42 and 77 kgs.keeping weight on one pan and object on the other, what is max you can weight less than 178 kgs?

- a. 17
- b. 172
- c. 175
- d. 174

56) Professor nitwin obtains a hash number of a given of an positive integer > 3 as follows.he subtract 2 from the number (to get new number).and multiplies the new number by 2 to get a term .he repeats this with the new number (to get newer numbers and terms) until the number becomes 2 or 2.the hash is defined as the sum of all terms generatrd in the progress

For example, with the number 5, he multiplies $(5-2=3)$ by 2 to get the first term 6. He multiplies $(3-2=1)$ by 2 to get the second term 2. As the number has became 1,he stops. The hash is the sum of the two terms $(6+2)$ or 8.

57) If professor nitwin given 3 numbers 4,9,13 and what is the hash numbers he obtins for the three numbers?

- a. 03
- b. 108
- c. 13
- d. 120

58) In the village , every weekend three eighth of the men and one third of the women participate in the social activity. if the total participant is 54 out of them 18 men then the total number of men and women in the village are ?

- a. 156
- b. 180
- c. 204
- d. 228

59) Thomas takes 7 days to paint a house completely whereas Raj would require 9 days to paint the same house completely, how many days will it take to complete the house, if both of them work together (give answer to the nearest integer)?

- a. 5
- b. 3
- c. 2
- d. 1

60) How many 6-digit even numbers can be formed using the digits 1, 2, 3, 4, 5, 6 and 7, so that the digit should not repeat and the second last digit is even?

- a. 720
- b. 320
- c. 6480
- d. 2160

61) University of Vikramasila has enrolled in the PhD

candidates: Babu, Chitra, Dheeraj, Esha, Farooq, Isqbal, Jacob, Hameed.

- I. Farooq and Isqbal were enrolled on the same day as each other, but no one else was enrolled on the same day
- II. Chitra and Gowri were enrolled on the same day as each other, but no one else was enrolled on the same day
- III. On each of the days of hiring, exactly one candidate was enrolled
- IV. Esha was enrolled before Babu
- V. Dheeraj was enrolled after Isqbal but before Esha
- VI. Gowri was enrolled both before Jacob and Babu
- VII. Babu was enrolled before Jacob

Who were the last two candidates enrolled last?

- a. Gowri and Chitra
- b. Esha and Jacob
- c. Babu and Chitra
- d. Babu and Gowri

62) When 100 is to be successively divided by 6, 3, 4, first divide 100 by 6. Then divide the quotient by 3. Then divide the quotient by 4. A number when successively divided

by 5,3,2, gives remainder 0,2 and respectively in that order. What will be the remainders when the same number is divide successively by 2,3, and 5 in than order?

- a. 4,3,2,
- b. 4,1,2,
- c. 1,0,4
- d. 2,1,3

63) Out of a group of swans, $\frac{7}{2}$ times the square root total number are playing on the shore of the pond. The remaning 2 are inside the pond .find the total number of swans

- a. 16
- b. 25
- c. 9
- d. 4

64) There are 20 person among whom two are sisters. find the numbers of ways we can arrange them a circle so that exactly one person between the 2 sisters? Please note the exact position on the circle does not matter (no seat number are marked on the circle), only he relatively position of the people matter.

- a. None of these
- b. $2! \cdot 19!$
- c. $18!$
- d. $2 \cdot 18!$

65) Of 60 students in a class, anyone who has chosen to study Maths elects to study Physics as well. But no student studies Maths and Chemistry, and 16 study Physics and Chemistry. Each of the students elect for at least one of the three subjects and the number of people who study exactly one of the three is more than the number who do more than one of the three. What are the maximum and minimum number of students who could have studied only Chemistry?

Option 1 : 44, 0 Option 2 : 38,2 Option 3 : 28,0 Option 4 : 40,0

66) The average score in an examination of 10 students of a class is 60. If the scores of the top five students are not considered, the average score of the remaining students falls by 5. The pass mark was 40 and the maximum mark was 100. It is also known that none of the students failed. If each of the top five scorers had distinct integral scores and each of their scores are greater than any of the remaining scores, the maximum possible score of the topper is Option 1 : 95 Option 2 : 100 Option 3 : 87 Option 4 : 99

67) 3L of milk are drawn from a container containing 30L of milk. It is replaced by water and the process is repeated 2 times. What is the ratio of milk to water at the end?

Option 1 : 729 / 271 Option 2 : 2187/100 Option 3 : 81/ 19 Option 4 : 743/229

68) a, b, c are real numbers in a Geometric Progression (G.P.) such that $|a + b + c| = 15$. The median of these three terms is a, and $b = 10$. If $a > c$, what is the product of the

first 4 terms of this G.P.? Option 1 : 40,000 Option 2 : 32,000 Option 3 : 8,000 Option 4 : 2,500

69) B takes 12 more hours than A to complete a task. If they work together, they take 16 fewer hours than B would take to complete the task. How long will it take A and B together to complete a task twice as difficult as the first one?

Option 1 : 16 hours Option 2 : 12 hours Option 3 : 14 hours Option 4 : 8 hours

70) A number when divided by 18 leaves a remainder 7. The same number when divided by 12 leaves a remainder n. How many values can n take? Option 1 : 1 Option 2 : 2 Option 3 : 0 Option 4 : 3

71) In how many ways can we stack n different coins so that two particular coins are not adjacent to each other? [Note that $m! = (1)(2)(3)\dots(m)$] Option 1 : $(n - 2) * (n - 1)!$ Option 2 : $(n - 2)!$ Option 3 : $(n - 1) * (n - 1)!$ Option 4 : $(n) * (n - 2)!$

72) For how many integer values does the following inequality hold good? $(x + 2)(x + 4)(x + 6)\dots(x + 100) < 0$

73) Consider the set $S = \{8, 5, 1, 13, 34, 3, 21, 2\}$. Akshay lists all the two element subsets of S and takes the larger of the elements in each set. If he sums all these numbers, the sum he will obtain is _____

74) Set P comprises all positive multiples of 4 less than 500. Set Q comprises all positive odd multiples of 7 less than 500, Set R comprises all positive multiples of 6 less than 500. How many elements are present in $P \cup Q \cup R$? _____

75) A 70 foot pole stands vertically in a horizontal plane supported by three 490 foot wires, all attached to the top of the pole. Pulled and anchored to three equally spaced points in the plane. How many feet apart are any two of those anchor points?

76) When Aasha and Usha stand on a weighing scale together the reading shows 151 kgs, when Usha and Isha stand together the real reading is 132kgs and when Isha and Aasha stand together the reading is 115kgs .what is the weight of Usha in kgs?

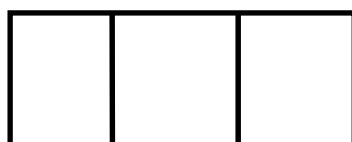
77) 100 books are distributed to 30 people so that each receives at least one book. the least number of people that would receive the same number of book is?

78) In the figure shown, each side of the outer square is divided into four equal segments as shown. The shaded square in the middle has area 18 square units. What is the area of the outer square in sq. units?

79) Six bags of marbles contain 18, 19, 21, 23, 25 and 34 marbles, respectively. All the marbles in one of the bags are chipped. The other 5 bags contain no chipped marbles. Ria takes three of the bags and Ruhi takes two of the others. only the bag of

chipped marbles remains. If Ria gets twice as many marbles as Ruhi how many chipped marbles are there?

- 80) Brinda and shanthi run in opposite direction on a circular track starting at diametrically opposite points .They first meet after Brindha has run 100 meters .They next meet after shanthi has run 150 meters past their first meeting point. Each girl runs at a constant speed .What is the length of the track in meters?
- 81) All nonempty subsets S of $\{1, 2, 3, 4, 5, 6, 7\}$. How many do not contain the number $|S|$, Where $|S|$ denotes the number of the elements in S ? For example, $\{3, 4\}$ is one such subset, since it does not contain the number 2.
- 82) All the digits 2,4,7,8 and 9 are placed in the grid, one in each cell, to form two three-digit numbers that are squares. Which digit is placed in the Centre of the grid?



- 83) In the sequence 2001, 2002, 2003,, each term after the third is found by subtracting the previous term from the sum of the two terms that precede that term. For example, the fourth term is $2001 + 2002 - 2003 = 2000$. What is the 2018th term in this sequence?
- 84) Asha is taking a group of eight children of different ages (all of whom have celebrated a birthday) on a picnic. During the trip, the oldest child, who is 9, spots a license plate with a 4- digit number in which each of two digits appears two times. "Look, Miss" she exclaims. "That number is evenly divisible by the age of each of us kids!" That's right," replies Asha , " and the last two digits just happen to be my age," Which integer from 1 to 9 is not the age of one of the children?
- 85) Ria is playing with a calculator. She enters an integer, and takes its square root. Then she respects the process with the integer part of the answer. After the third repetition, the integer part equate 1 for the first time. What is the difference between the largest and the smallest number Ria could have started with?
- 86) Latha is going to build a tower by stacking lego-like bricks atop one another. The tower is to be 20 units tall. Latha has some bricks that are 2 units tall, and other bricks that are 5 units tall. In how many different ways can she build the tower?
- 87) A cryptographic code is designed as follows. The message to lower case (all capital letters are replaced by the corresponding small letters – thus " A" is replaced by "a"). The first time letter appears in the message, it is replaced by the letter that is 1 place to its right in the alphabet (assuming that the letter "a" is one place to the right

of the letter “z”). The second time this same letter appears in the given message, it is replaced by the letter that is $1 + 2$ places to the right, the third time it is replaced by the letter that is $1 + 2 + 3$ places to the right, and so on, for example, with this code the word “banana” become s”cbodqg” what letter will replace the last “s” in the message “Lee’s sis is a Mississippi miss, Chriss!”?

88) The first term of a sequence is 2005. Each succeeding term is the sum of the cubes of the digits of the previous term. What is the 2018th term of the sequence?

89) $N = 999,999,999,999,999,999$. How many 9s are there in the decimal expansion of $N^{1/2}$?

90) Let $a(1) = 2$ and for $n \geq 1$, $a(n+1) = (a(n)-1) / (a(n)+1)$. The value of $a(100)$ is

91) The product $8 \times 888 \dots 8$, where the second factor has n digits, is an integer whose digits have a sum of 1000. What is n ?

92) It is possible to pair up all the numbers from 1 to 70 so that the positive difference of the numbers in each pair is always the same. For example, one such pairing up is (1,2), (3,4), (5,6),....(69,70). Here the common on difference is 1. What is the sum of all such common differences.

93) a, b, c are positive numbers such that $a + b + ab = 8$, $b + c + bc = 15$ and $c + a + ca = 35$

What is the value of $a + b + c + abc$?

94) In the figure shown, a triangle is divided into nine stripes of equal height each parallel to the same side of the triangle. The shaded stripes have a total area of 135 square units. What is the area of the triangle in square units?

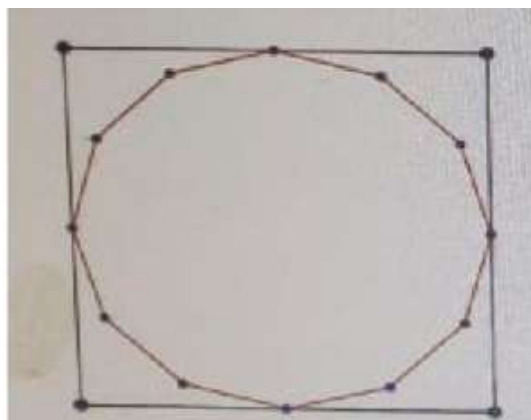


95) In how many ways can we give change for Rs.100 using 1 rupee and 2 rupee coins? For example for 5 Rs, we can give in three ways : (1,1,1,1,1) (1,1,1,2) (1,2,2).

96) What is the number of positive integers that divide $1 \times 2 \times 3 \times 4 \times 5 \times 6 \times 7 \times 8 \times 9 \times 10$ without leaving a remainder?

97) What is the number of positive integers less than or equal to 2017 that have at least one pair of adjacent digits that are both even (for example 24,564 are two examples of such numbers while 1276 does not satisfy the required property).

- 98) The set $A(0)$ is $(1, 2, 3, 4)$. For $n > 0$, $A(n+1)$ contains all possible sums that can be obtained by adding two different numbers from $A(n)$. What is the number of integers in $A(10)$.
- 99) In this question x^y stands for x raised to the power y . For example $2^3=8$ and $4^{1.5}=8$. Find the number of positive integers $N \geq 2000$ which can be expressed as $N=2^m+2^n$ where m, n are integers (for example, $33=2^0+2^5$).
- 100) The greatest common divisor of two numbers A and B is 22. The least common multiple of A and B is 2002, if A has fewer divisors than B , what is $A + B$?
- 101) For a positive integer N . Let $P(N)$ be the product of the digits of N . For Example, $P(123) = 6$. The value of $P(101) + P(102) + \dots + P(201) + P(202)$ is
- 102) We have two cubes. The sum of the volume of the two cubes is 25. The sum of a side length of one cube and a side length of the other is 4. What is the sum of the total surface areas of the two cubes?
- 103) Usha has three boxes with ten balls in each. She plays a game where the goal is to end up with as few balls as possible in the boxes. The boxes are each marked with a separate number 4, 7, and 10. It is allowed to remove n balls from the box marked with the number N , put three of them aside and put the rest in another box. What is the least possible number of balls the boxes together can contain in the end?
- 104) In the surprise test, there were 8 questions. Every student guessed the answer and it was found that each answered exactly 4 questions correctly. However no two students answered the same set of questions correctly. What is the maximum number of students in the class?
- 105) A regular polygon with 12 sides (dodecagon) is inscribed in a square of area 24 square units as shown in the figure where four of the vertices are mid points of the sides of the square. The area of the dodecagon in square units is.



- 106) 8.PI-> IP ZZ->ZZZZ A->AA
For example,PIZZA can become PIPZZZZAA (by the first,third, and fourth transformation applied sequentially),and the IPIZZZZAA(by the second transformation)
Consider the following statements
I) The string IPIZZZZZAAA can be obtained after some set of transformations
II) The string IPIPZZZZZZAAAA can be obtained after some set of transformations
A. Only I is true
B. Only II is true
C. Both I and II are true
D. Neither a nor B is true
- 107) It is known that in the sequence A,X,B,C,D,Y,11 the sum of any 3 consecutive terms is 19, The value of A+B+C+D is?
11
None of these
21
30
- 108) From the sequence 1 3 1 4 5 2 we can extract the subsequences 1 4 5 2,1 3 2 and 3 4 2. These lists are called “up and downstream sequences”, as all the numbers to left of maximum value (the up part) are in strictly ascending order, and those to the right of the maximum are in the descending order(the down part). Note that there must be atleast one number to the left of the maximum value(the up part) and atleast one number to the right of the subsequence(the down part)
A maximal up and down sunsequence is one with the maximum length. Note that there must be more than one maximal up and down subsequence in the given sequence. In the sequence 1 4 3 6 2 1, the two subsequences 1 4 3 2 1 and 1 4 6 2 1 are both maximal up and down subsequences.
A maximal subsequence like 1 4 3 2 1 may have many up and down subsequences of its own which have the same maximum value(4). These are 1 4 3; 1 4 2; 1 4 1; 1 4 3 2; 1 4 3 1; 1 4 2 1; and 1 4 3 2 1(a total of 7). This includes the full subsequences also.
13
A similar enumeration shows that 1 4 6 2 1 has 9 up and down subsequences that have 6 as the maximum value.
- 109) p,q are odd positive integers such that $(1+3+5+...+p)+(1+3+5+...+q)=1+3+5+...+19$ then p+q is
---divisible by 19
--- an odd number
---divisible by 13 (Answer)
---a prime number
- 110) The numbers 1 to 9 are represent by the letter A to I in some order, and no two letters represent the same number. whar are the following facts
A<H<F<D
D>B>I>H>E
C<G<A

F>B>E>A

Use these to determine which letter stands for which number, and then find the value of

$(A+1)+2*(B+H)+3*(C+G)+4*(D+F)+5*E$ Here "*" stands for multiplication

Fill in the blanks with the answer , Do not put any white space before or after the answer

Answer: 130

- 111) 32 times of a two digit number is 23 times the number obtained by reversing its digit.

The sum of its digit is 15 Find the number:

A. 96

B. 69

C. 87

D. Insufficient Information

Answer: B

Explanation:

Let the number be $10a + b$

Reverse of the number = $10b + a$

$$32(10a + b) = 23(10b + a)$$

$$\rightarrow 320a + 32b = 230b + 23a$$

$$\rightarrow 297a = 198b$$

$$\rightarrow a/b = 6/9 = 2/3$$

$$\rightarrow a = 2/3b \text{ ---(1)}$$

$$a + b = 15 \text{ ---(2)}$$

$$\rightarrow 2b/3 + b = 15$$

$$\rightarrow 5b = 45$$

$$\rightarrow b = 9$$

$$\rightarrow a = 6$$

- 112) Eesha's father was 34 years of age when she was born. Shashank (younger brother of Eesha), is 13 years old and he is very proud of the fact that he is as tall as Eesha, even though he is three years younger than her. Eesha's mother, who is shorter than Eesha was only 29 when Shashank was born . What is the sum of the ages of Eesha's parents now?

A. 92 years

B. 76 years

C. 66 years

D. 89 years

Answer: A

Explanation:

Age difference of Eesha and her father = 34

Age difference of Shashank and his mother = 29

Eesha's current age = Shashank's age + 3

Eesha's current age = 16

Eesha's father's age = $34 + 16 = 50$

Eesha's mother's age = $13 + 29 = 42$

Sum of parents ages = $50 + 42 = 92$ years

- 113) Apples cost L rupees per kilogram for the first 30 kilograms and Q rupees per kilogram for each additional kilogram. If the price paid for 33 kilograms of apples is Rs. 1167 and for 36 kilograms of apples is Rs. 1284, then the cost of the first 10 kilograms of apples is:

A. Rs. 117
B. Rs. 1053
C. Rs. 350
D. Rs. 281

Answer: C

Explanation:

$$\text{Cost of 33 kilograms of apples} = \text{Rs. 1167}$$

$$\text{Cost of 36 kilograms of apples} = \text{Rs. 1284}$$

$$3 \text{ kilograms of apples cost (after 30kg)} = 1284 - 1167 = \text{Rs. 117}$$

$$\begin{aligned} \text{Cost of 30 kilograms of apples} &= 1167 - 117 \\ &= \text{Rs. 1050} \end{aligned}$$

$$\begin{aligned} \text{Cost of 10 kilograms of apples} &= 1050 / 30 \times 10 \\ &= \text{Rs. 350} \end{aligned}$$

- 114) In this question x^y stands for x raised to the power y. For example, $2^3 = 8$ and $4^{1.5} = 8$. If a, b are real numbers such that $a + b = 3$, $a^2 + b^2 = 7$, the value of $a^4 + b^4$ is?

A. 49
B. 45
C. 51
D. 47

Answer: D

Explanation:

$$(a + b)^2 = a^2 + b^2 + 2ab$$

$$9 = 7 + 2ab$$

$$\rightarrow ab = 1$$

$$(a+b)^4 = [(a+b)^2]^2$$

$$(a+b)^4 = [a^2 + b^2 + 2ab]^2$$

$$\rightarrow 81 = a^4 + b^4 + 4a^2b^2 + 2a^2b^2 + 4ab(a^2 + b^2)$$

$$\rightarrow 81 = a^4 + b^4 + 4 + 2 + 4(7)$$

$$a^4 + b^4 = 81 - 28 - 2 - 4 = 47$$

- 115) A 70 foot pole stands vertically in a horizontal plane supported by three 490 foot wires, all attached to the top of the pole, pulled up and anchored to three equally spaced points in the plane. How many feet apart are any two of those anchor points?

A. 740
B. 840
C. 960
D. 1024

Answer: B

Explanation:

The wires will be equally spaced at the circumference of a circle in the plane as shown in the figure above.

The three points will form an equilateral triangle, with the sides of the triangle equal to the shortest distance between the points.

Let the side of the triangle be 'a'.

'r' is the radius of the circum-circle of the given triangle

Thus, $a = \sqrt{3} r$ ---(1)

Now,

$$4902 = r^2 + 702$$

$$r^2 = 702(72 - 1)$$

$$r^2 = 702(48)$$

$$r = 70(4\sqrt{3}) = 280\sqrt{3}, \text{ putting in (1)}$$

$$a = \sqrt{3} * 280\sqrt{3}$$

$$= 840 \text{ ft} = \text{distance between the points}$$

- 116) If $x = (16^3 + 17^3 + 18^3 + 19^3)$, then x when divided by 70 leaves a remainder of ?

A. 0

B. 1

C. 35

D. 69

Answer: A

Explanation:

$$x = (16^3 + 17^3 + 18^3 + 19^3)$$

$$x = (16^3 + 19^3 + 17^3 + 18^3)$$

$$x = (16 + 19)(16^2 + 19^2 - 16 * 19) + (17 + 18)(17^2 + 18^2 - 17 * 18)$$

$$x = 35(\text{even} + \text{odd} - \text{even}) + (35)(\text{odd} + \text{even} - \text{even})$$

$$x = 35(\text{odd}) + 35(\text{odd})$$

$$x = 35(\text{odd} + \text{odd})$$

$$x = 35(\text{even})$$

$$x = 35(2n)$$

$$x = 70n$$

Remainder when x is divided by 70 will be '0'

- 117) Consider the triangle shown in the figure where $BC = 12 \text{ cm}$, $DB = 9 \text{ cm}$, $CD = 6 \text{ cm}$ and $\angle BCD = \angle BAC$, what is the ratio of the perimeter of $\triangle ADC$ to that of $\triangle BDC$?

A. 7/9

B. 8/9

C. 6/9

D. 5/9

Answer: A

Explanation:

Consider $\triangle ABC$ and $\triangle BCD$

$$\angle BCD = \angle BAC \text{ (given)}$$

$$\angle B = \angle B \text{ (Common angle)}$$

By Angle-Angle property

$\triangle ABC$ and $\triangle BCD$ are similar

Hence,

- 118) Consider an obtuse-angled triangle with sides 8 cm, 15 cm and x cm. If x is an integer then how many such triangles exist?

A. 5
B. 21
C. 10
D. 15
E. 14

Answer: C

Explanation:

As per side-inequality theorem, $15-8 < x < 15+8$

or, $7 < x < 23$.

Case I: 15 is the largest side

$8^2 + x^2 < 15^2 \Rightarrow x^2 < 161$ [Obtuse-angled triangle]

or, $x < 13$

Possible values of $x = 8, 9, 10, 11, 12$

= 5 values

Case II: x is the largest side

$8^2 + 15^2 < x^2$

$\Rightarrow x > 17$

Possible values of $x = 18, 19, 20, 21, 22$

= 5 values

Thus, there are 10 possible triangles.

- 119) If where $[x]$ denotes the greatest integer less than or equal to x , then

A. $96 \leq n < 104$
B. $104 \leq n < 107$
C. $107 \leq n < 111$
D. $111 \leq n < 116$

Answer: C

Explanation:

$\log_{10} 1 = 0$

$\log_{10} 10 = 1$

$\log_{10} 100 = 2$

Since $[x]$ denotes the greatest integer less than or equal to x

$\Rightarrow [\log_{10} 2] = [\log_{10} 3] = \dots = [\log_{10} 9] = 0$

$\Rightarrow [\log_{10} 1] + [\log_{10} 2] + [\log_{10} 3] + \dots + [\log_{10} 9] = 0$

Also,

$[\log_{10} 10] = [\log_{10} 11] = \dots = [\log_{10} 99] = 1$

$\Rightarrow [\log_{10} 10] + [\log_{10} 11] + \dots + [\log_{10} 99] = 90$

Similarly,

$[\log_{10} 100] = [\log_{10} 101] = [\log_{10} 102] = \dots = [\log_{10} 999] = 2$

$[\log_{10} 1] + [\log_{10} 2] + \dots + [\log_{10} 9] + [\log_{10} 10] + \dots + [\log_{10} 99] + [\log_{10} 100] + \dots + [\log_{10} n] = n$

$\Rightarrow 0 + 90 + [\log_{10} 100] + \dots + [\log_{10} n] = n$

$\Rightarrow 90 + 2(n - 99) = n$ (Since n cannot be greater than 116 from the options)

$\Rightarrow 2n - n - 198 + 90 = 0$

--> $n = 108$

Hence the correct answer is (c) $107 \leq n < 11$.

- 120) A man travels three-fifths of distance AB at a speed of $3a$, and the remaining at a speed of $2b$, if he goes from A to B and back at a speed of $5c$ in the same time, then

- A. $1/a + 1/b = 1/c$
- B. $a + b = c$
- C. $1/a + 1/b = 2/c$
- D. None of these

Answer: C

Explanation:

Let 'x' be the distance between A and B.

Time taken to cover the distance with speed $3a = ((3x/5))/3a$

Time taken to cover the distance with speed $2b = ((2x/5))/2b$

Time taken to cover the distance x from B to A then return = $2x/5c$

- 121) Ten years ago, the ages of the members of a joint family of eight people added up to 231 years. Three years later, one member died at the age of 60 years and a child was born during the same year. After another three years, one more member died, again at 60, and a child was born during the same year. The current average age of this eight-member joint family is nearest to:

- A. 23 years
- B. 22 years
- C. 21 years
- D. 25 years
- E. 24 years

Answer: E

Explanation:

Ten years ago, the sum of the ages of 8 members in the family = 231

After 3 years, the age of every member increases by 3; hence the total age increases by $8 \times 3 = 24$.

The total age is $231 + 24 = 255$

A member of 60 years age died = $255 - 60 = 195$

Similarly, again after 3 years,

Sum of the ages of all members = $195 + 24 = 219$

Again, a member of age 60 died = $219 - 60 = 159$

Now they have asked the sum in the current years, so the remaining years are 4.

Hence the sum increases by $8 \times 4 = 32$

Total sum of the ages of 8 members in the present year = $159 + 32 = 191$

Average age = $191 / 8 = 23.8 = 24$ (approx)

- 122) George can do some work in 8 hours. Paul can do the same work in 10 hours while Hari can do the same work in 12 hours. All the three of them start working at 9 a.m. while George stops work at 11:00 a.m., the remaining two complete the work, approximately when will the work be finished?

- A. 11:30 a.m.
- B. 12:00 p.m.
- C. 12:30 p.m.
- D. 1:00 p.m.

Answer: D

Explanation:

George --> 8 hrs

Paul --> 10 hrs

Hari --> 12 hrs

Total work = LCM (8,10,12) = 120 units

George --> 15 units/hr

Paul --> 12 units/hr

Hari --> 10 units/hr

Combined efficiency = 15 + 12 + 10 = 37 units/hr

Work done by all of them in 2 hrs (by 11 am) = 37 x 2 = 74 units

Remaining work = 120 - 74 = 46 units

Combined efficiency of Paul & Hari = 22 units/hr

Time taken to complete remaining work = 46/22 = Approx 2 hours

Thus, the final time = 11 am + approx 2 hours = 1 pm.

- 123) The 260th term of the series a, b, b, c, c, c, d, d, d, d, e, e, e, e, e, f, f, f, f, f,is:

- A. U
- B. W
- C. T
- D. V

Answer: B

Explanation:

Total number of terms in the series = $26(26+1)/2 = 351$

$351 - 26 = 325$ --> (326 to 351 will be z)

$325 - 25 = 300$ --> (301 to 325 will be y)

$300 - 24 = 276$ --> (277 to 300 will be x)

$276 - 23 = 253$ --> (254 to 276 will be w)

So, the 260th element in the series is w.

- 124) In the diagram below, the areas of the triangles are as follows: $A_1 = 1024$, $A_2 = 1016$, $A_3 = 1057$. What is the area of A_4 ?

- A. 1023
- B. 1036
- C. 1020
- D. 1065

Answer: D

Explanation:

125) Rs. 3000 is distributed among A, B and C such that A gets $\frac{2}{3}$ rd of what B and C together get and C gets $\frac{1}{2}$ of what A and B together get. Find C's share?

- A. Rs. 1500
- B. Rs. 1000
- C. Rs. 1200
- D. Rs. 1800

Answer: B

Explanation:

C get $\frac{1}{2}$ of what A and B together get.

$$\rightarrow C = \frac{1}{2}(A + B)$$

$$\rightarrow A + B = 2C \text{ ---(1)}$$

$$\text{Given, } A + B + C = 3000$$

From (1)

$$(2C) + C = 3000$$

$$C\text{'s share} = 1000$$

TCS DIGITAL SAMPLE QUESTIONS

ADVANCED APTITUDE

SET 1

Areas of Focus

Quantitative Aptitude	Logical Reasoning
Numbers	Logical Sequencing
Averages Mixtures and alligations	Picture Analysis
Time and Work	Word Puzzle
Permutation and Combination	Blood Relations
Geometry and Mensuration	Clocks
Ratio and Proportion	Cubes
Profit and loss	Data Arrangement
Time, Speed and Distance	
Percentage	
Probability	
Ages	
Progressions	

126) Each of Alia, Betty, Carol and Dalia took a test. Each of them answered at least one question correctly, and altogether they answered 67 questions correctly. Alia had more correct answers than anyone else. Betty and Carol together answered 43 questions correctly. How many correct answers did Dalia have?

- A. 1 B. 2 C. 3 D. 5

127) An ant smartly moves across a staircase taking the shortest distance. Calculate the distance it takes to reach the top: B from A given that staircase consists of 2 steps. It is also known that the length, breadth and height is 6cm, 2cm and 1 cm respectively.

- A. $6\sqrt{2}$ B. 6 C. 7 D. $2\sqrt{19}$

128) In this problem $m!$ represents (m factorial), or the number that results when multiplying $1, 2, 3, \dots, m$. Hence $4! = 1 \times 2 \times 3 \times 4 = 24$.

For how many values of n , is $[(n!)^2 + 23]$ a perfect square?

- A. 4 B. 3 C. Infinitely many D. 0

129) The rupee/coin changing machine at a bank has a flaw. It gives 10 ten rupee notes if you put a 100 rupee note and 10 one rupee coins if you insert a 10 rupee note but gives 10 hundred rupee notes when you put a one rupee coin. Sivaji, after being ruined by his rivals in business is left with a one rupee coin and discovers the flaw in the machine by accident. By using the machine repeatedly, which of the following amounts is a valid amount that Sivaji can have when he gets tired and stops at some stage (assume that the machine has an infinite supply of notes and coins):

- A. 26975 B. 53947 C. 18980 D. 33966

130) A spherical solid ball of radius 58 mm is to be divided into eight equal parts by cutting it four times longitudinally along the same axis. Find the surface area of each of the final pieces thus obtained (in mm^2)? (where $\pi = \frac{22}{7}$)

- A. 3365π B. 5046π C. 1682π D. 3346π

131) Professor absentminded has a very peculiar problem, in that he cannot remember numbers larger than 15. However, he tells his wife, I can remember any number up to 100 by remembering the three numbers obtained as remainders when the number is divided by 3, 5 and 7 respectively. For example (2,2,3) is 17. Professor remembers that he had (1,1,6) rupees in the purse, and he paid (2,0,6) rupees to the servant. How much money is left in the purse?

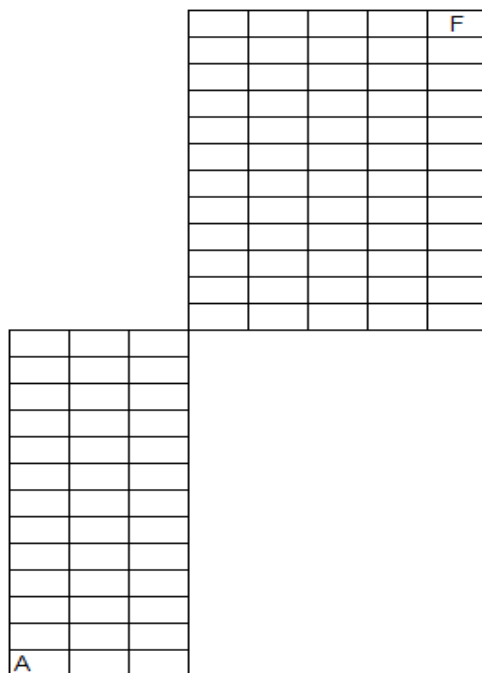
A. 59

B. 61

C. 49

D. 56

132) An ant starts moving on the mesh shown below along the wires towards a food particle. If the ant is at the bottom-left corner of cell A and the food is at the top-right corner of cell F, then find the number of optimal routes for the ant.



A. 13884156

B. 3465280

C. 4368

D. 6748

133) Two identical circles intersect so that their centers, and the points at which they intersect, form a square of side 1 cm. The area in sq. cm of the portion that is common to the two circles is:

A. $(\pi/2) - 1$

B. 4

C. $\sqrt{2} - 1$

D. $\sqrt{5}$

134) A call center agent has a list of 305 phone numbers of people in alphabetic order of names (but she does not have any of the names). She needs to quickly contact Deepak Sharma to convey a message to him. If each call takes 2 minutes to complete, and every call is answered, what is the minimum amount of time in which she can guarantee to deliver the message to Mr. Sharma?

- A. 18 minutes B. 610 minutes C. 206 minutes D. 34 minutes

135) Seven movie addicts- Guna, Isha, Leela, Madhu, Rinku, Viji and Yamini attend a film festival. Three films are shown, one directed by Rajkumar Hirani, one by S.Shankar, and one by Mani Ratnam. Each of the film buffs sees only one of the three films. The films are shown only once, one film at a time. The following restrictions must apply :- Exactly twice as many of the film buffs sees the S.shankar film as see the Rajkumar Hirani film.- Guna and Rinku do not see the same film as each other.- Isha and Madhu do not see same film as each other.- Viji and Yamini see the same film as each other.- Leela sees the S.Shankar film.- Guna sees either the Rajkumar Hirani film or the Mani Ratnam film.Which one of the following could be an accurate matching of the film buffs to films ?(A) Guna: the S.Shankar film; Isha: the Mani Ratnam film; Madhu: the S.Shankar film(B) Guna: the Mani Ratnam film; Isha: the Rajkumar Hirani film; Viji: the Rajkumar Hirani film(C) Isha : the S.Shankar film; Rinku: the Mani Ratnam film; Viji: the Rajkumar Hirani film(D) Madhu: the Mani Ratnam film; Rinku: the Mani Ratnam film; Viji: the Mani Ratnam film

- A. D B. C C. B D. A

136) A sudoku grid contains digits in such a manner that every row, every column, and every 3x3 box accommodates the digits 1 to 9, without repetition. In the following Sudoku grid, find the values at the cells denoted by x and y and determine the value of $6x + 15y$.

y						2	9	5
	1				3		8	
7		5		2				
	x		1	7		3	6	
	3		6	8		9		
	4			2				
9				3				2
5		3						
				6				

- A. 87 B. 75 C. 66 D. 99

- 137) Eric throws two dice, and his score is the sum of the values shown. Sandra throws one die, and her score is the square of the value shown. What is the probability that Sandra's score will be strictly higher than Eric's score?

- A. 137/216 B. 17/36 C. 173/216 D. 5/6

- 138) A rectangle of height 100 squares and width 200 squares is drawn on a graph paper. It is colored square by square from top left corner and moving across in a spiral turning right whenever a side of the rectangle or a colored square is reached. Which square is colored last? (give its row and column numbers – the bottom right square is on row 100 and column 200)

- A.50,50 B.51,50 C.51,150 D.50,150

- 139) 1, 7, 8, 49, 50, 56, 57, 343, 344, 350, 351, 392, 393, 399, 400,

The above sequence contains sums of distinct powers of 7 in the increasing order (7^0 , 7^1 , $7^1 + 7^0$, 7^2 etc). What is the value of term number 36?

- A.16857 B.16815 C.16863 D.16856

- 140) The number of integers n with $100 < n < 300$ such that 16 divides $(n^2 - n - 2)$ and 25 divides $(n^2 + 2n - 3)$ is

- A.3 B.2 C.4 D.1

- 141) George's salary is 20% more than Mark's, Harry's salary is 30% greater than George's. Tony's salary is 40% more than Albert's. Albert's salary is 20% lesser than George's. What is Albert's salary as a percentage of Tony's salary (to the nearest percentage point)?

- A.60% B.82% C.76% D.69%

- 142) A and B stand at distinct points of a circular race track of length 135 m. They cycle at speeds of a m/s and b m/s respectively. They meet for the first time 5 seconds after they start the race and for the second time 14 seconds from the time they start the race. Now, if B had started in the opposite direction to the one he had originally started, they would have met for the first time after 60 seconds. If B is quicker than A, find b .

- A.8 B.11 C.7 D.6

- 143) In a family, there are four daughters Aasha, Eesha, Trisha, and Usha. Each girl has exactly one necklace and one bracelet. Each of these eight ornaments was bought in

either 2007, 2008, or 2009. The eight ornaments were bought in a manner consistent with the following conditions:

The necklace for each girl was bought either in an earlier year than or in the same year as the bracelet for that girl.

The necklace for Eesha and the bracelet for Aasha were bought in the same year.

The necklace for Trisha and the bracelet for Usha were bought in the same year.

The necklace for Eesha and the necklace for Trisha were bought in different years.

The necklace for Aasha and the bracelet for Trisha were bought in 2008.

If the necklace for Trisha was bought in an earlier year than the bracelet for Trisha was, then which one of the following statements could be true?

A. The bracelet for Usha was bought in 2008.

B. The necklace for Eesha was bought in 2008.

C. The necklace for Eesha was bought in 2007.

D. The necklace for Usha was bought in 2008.

- 144) If 12 divides $ab313ab$ (in decimal notation, where a, b are digits > 0), the smallest value of $a + b$ is

A. 6

B. 7

C. 4

D. 2

- 145) The length, breadth and height of a room are in the ratio 3:2:1. If the breadth and height are halved while the length is doubled, then the total area of the four walls of the room will:

A. Decrease by 15% B. Decrease by 13.6% C. Decrease by 30% D. Decrease by 18.75%

- 146) Of a set of 30 numbers, the average of first 10 numbers is equal to the average of last 20 numbers. Then the sum of the last 20 numbers is

A. 2 x sum of first ten numbers

B. sum of first ten numbers

C. Cannot be determined with the given data D. 2 x sum of last ten numbers

- 147) 7 letters are to be delivered to 7 addresses. In how many ways can all the letters can be delivered to a wrong address?

A. 1854

B. 1654

C. 1754

D. 1454

- 148) How many words are there between $anegl$ to $egnla$, if you arrange the letter of word ANGEL in all possible ways?

A. 16

B. 17

C. 18

D. 19

- 149) One day, Eesha started 30 minutes late from home and reached her office 50 minutes late, while driving 25% slower than her usual speed. How much time in minutes does Eesha usually take to reach her office from home?

A. 20

B. 40

C. 60

D. 80

- 150) The water from one outlet, flowing at a constant rate, can fill the swimming pool in 9 hours. The water from second outlet, flowing at a constant rate can fill up the same pool in approximately in 5 hours. If both the outlets are used at the same time, approximately what is the number of hours required to fill the pool?

a) 4 hours b) 3.21 hours c) 5.5 hours d) 6 hours

- 151) Jose is a student of horticulture in the University of Hose. In a horticultural experiment in his final year, 200 seeds were planted in plot I and 300 were planted in plot II. If 57% of the seeds in plot I germinated and 42% of the seeds in plot II germinated, what percent of the total number of planted seeds germinated?
a) 45% b) 56% c) 70% d) 48%
- 152) A closed cylindrical tank contains 36π cubic feet of water and its filled to half its capacity. When the tank is placed upright on its circular base on level ground, the height of water in the tank is 4 feet. When the tank is placed on its side on level ground, what is the height, in feet, of the surface of the water above the ground?
a) 8 Ft b) 5 Ft c) 3 Ft d) 11 Ft
- 153) College T has 1000 students. Of the 200 students majoring in one or more of the sciences, 130 are majoring in Chemistry and 150 are majoring in Biology. If at least 30 of the students are not majoring in either Chemistry or Biology, then the number of students majoring in both Chemistry and Biology could be any number from
a) 120 to 150 b) 110 to 130 c) 140 to 160 d) 100 to 145
- 154) Analysing the good returns that Halocircle Insurance Pvt Ltd was giving, Ratika bought a 1-year, Rs 10,000 certificate of deposit that paid interest at an annual rate of 8% compounded semi-annually. What was the total amount of interest paid on this certificate at maturity?
a) Rs. 800 b) Rs. 456 c) Rs. 816 d) Rs. 390
- 155) A dealer originally bought 100 identical batteries at a total cost of q rupees. If each battery was sold at 50 percent above the original cost per battery, then, in terms of q , for how many rupees was each battery sold?
a) q b) $2q/100$ c) $3q/200$ d) $4q/300$
- 156) Rural households have more purchasing power than do urban households at the same income level, since some of the income urban and suburban households use for food and shelter can be used by the rural households for other needs. Which of the following inferences is best supported by the statement made above?
(A) The average rural household includes more people than does the average urban or suburban household.
(B) Rural households have lower food and housing costs than do either urban or suburban households.
(C) Suburban households generally have more purchasing power than do either rural or urban households.
(D) The median income of urban and suburban households is generally higher than that of rural households.
(E) All three types of households spend more of their income on housing than on all other purchases combined.
a) A b) B c) C d) D e) E
- 157) The present ratio of students to teachers at a certain school is 30 to 1. If the student enrollment were to increase by 50 students and the number of teachers were to increase by 5, the ratio of the teachers would then be 25 to 1. What is the present number of teachers?

a) 20 b) 32 c) 10 d) 15

158) A certain company retirement plan has a rule of 70 provision that allows an employee to retire when the employee's age plus years of employment with the company total at least 70. In what year could a female employee hired in 1986 on her 32nd birthday first be eligible to retire under this provision?

a) 2000 b) 2009 c) 1999 d) 2005

159) A bakery opened yesterday with its daily supply of 40 dozen rolls. Half of the rolls were sold by noon and 80 % of the remaining rolls were sold between noon and closing time. How many dozen rolls had not been sold when the bakery closed yesterday?

a) 4 b) 6 c) 8 d) 10

160) Machine A produces bolts at a uniform rate of 120 every 40 second, and Machine B produces bolts at a uniform rate of 100 every 20 seconds. If the two machines run simultaneously, how many seconds will it take for them to produce a total of 200 bolts?

a) 15 seconds b) 25 seconds c) 30 seconds d) 35 seconds

161) What is the lowest possible integer that is divisible by each of the integers 1 through 7, inclusive?

a) 230 b) 560 c) 420 d) 700

1. Anand packs 304 marbles into packets of 9 or 11 so that no marble is left. Anand wants to maximize the number of bags with 9 marbles. How many bags does he need if there should be at least one bag with 11 marbles.

a) 36 b) 8 c) 24 d) 32

2. A Circle has 29 points arranged in a clockwise manner from 0 to 28. A bug moves clockwise manner from 0 to 28. A bug moves clockwise on the circle according to following rule. If it is at a point; on the circle it moves clockwise in 1 sec by $(1+r)$ places, where r is remainder (possibly 0) when l divided by 11. If it starts in 23rd position, at what position will it be after 2012 sec.

a) 10 b) 20 c) 17

3. The geocity planning office is exploring the use of cones for water towers, and has built a model in their office. The model is a hollow, open (no top) right circular cone. An intelligent mathematical bug is sitting at the point A (at top), and a drop of honey is accidentally dropped at point B (on the opposite side of the cone, at the top). The

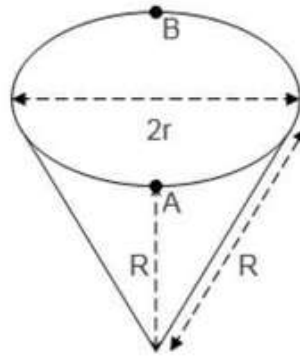
bug crawls to the honey on the surface of the cone by the shortest path.
If $R=270$ cm (slant height) and $r=90$ cm (radius), then what is the distance (in cm) crawled by the bug before reaching the honey?

A)135

B)270

C)282.6

D)141.3



4. George and Mark can paint 720 boxes in 20 days, Mark and Henry in 24 days, Henry and George in 15 days. George works for 4 days, Mark for 8 days and Henry for 8 days. The total no of boxes painted by them is?

a. 516

b. 492

c. 348

d. 252

5. A team won 80 % of the games it played. It played 5 more games of which it won 3 and lost 2. Its loss percentage changed to 25%. How many games did it play overall?

a)25 b) 14 c) 16 d)20

6.3 friends A,B,C went for week end party to McDonald's restaurant and there they measure their weights in some order in 7 rounds. A, B, C, AB, BC, AC, ABC. Final round measure is 155 kg, then find the average weight of all the 7 rounds? a.88.57 b.92.47 c.96.54 d. 95.58

7. 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

8. There is a pool of radius X and there is a pathway around the pool with a width of 4 feet. Find the radius of the pool if the path area/ pool area = $11/25$.

a)12 b)20 c)25 d)29

9. . A school has 120, 192 and 144 students enrolled for its science, arts and commerce courses. All students have to be seated in rooms for an exam such that each room has students of only the same course and also all rooms have equal number of students. What is the least number of rooms needed?

a) 18 b)19 c)20 d) 21

10. Chocolates Rs.164.90 it is used to sell chocolates for Rs.2 each but there were no sales at that price. When it is reduced the price, all chocolates sold out.Enabling the shop keeper to realize Rs. 164.90 from the chocolates alone. If the new price was not less than half the original price. How many chocolates were sold?

A.39 B.37 C.97 D.71

11. Two women Renu and Usha are working on an embroidery design. If Usha worked alone, she would need eight hours more to complete the design than if they both worked together. Now if Renu worked alone, it

would need 4.5 hours more to complete the design than they both working together. What time would it take Renu alone to complete the design?

- a) 10.5 hrs b) 12.5 hrs c) 14.5 hrs d) 18.5 hrs

12. The numbers 6,12,21,22,27,34 are placed in the boxes a,b,c,d,e,f shown below in a certain order such that the sum of the entries in each of the extreme rows and each of the extreme columns (i.e. top row,bottom row,left most column, right most column) are the same number K. What is the value of K?

9	A	B	14
C			d
23	E	F	25

- A.71 B.66 C.61 D.69