

TCS Latest Placement Paper Questions with solutions -2014 (12)

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

Ans: We know that Speed is inversely proportional to time

While she drives 25% slower means she drove at $\frac{3}{4}(S)$

We know that $D = S \times T$

When speed became $\frac{3}{4}(S)$ then Time taken should be $\frac{4}{3}(T)$

i.e, She has taken $\frac{4}{3}(T) - T$ extra to cover the distance.

Extra Time = $T_3 = 20$ min (as 20 min late due to slow driving)

Actual time $T = 60$ Minutes

2. In 2003 there are 28 days in February and 365 days in a year in 2004 there are 29 days in February and 366 days in the year. If the date march 11 2003 is Tuesday, then which one of the following would the date march 11 2004 would be?

Ans: If 11-3-2003 is Tuesday, Then 11-3 - 2004 is Thursday

The number of odd days between the two dates are $[3667]_{\text{Rem}} = 2$.

3) How many positive integers less than 500 can be formed using the numbers 1,2,3,and 5 for digits, each digit being used only once.

Ans: Single digit numbers = 4

Double digit numbers = $4 \times 3 = 12$

Three digit numbers = $3 \times 3 \times 2 \times 1 = 18$

Total = 34

4) A circular swimming pool is surrounded by a concrete wall 4 feet wide.if the area of the wall is $\frac{11}{25}$ of

the area of the pool, then the radius of the pool in feet is?

Let the radius of the pool be r . Then area of the wall and pool = $\pi(r+4)^2$

Area of the pool = $\pi(r)^2$

Area of the wall = $\pi(r+4)^2 - \pi(r)^2$

Given $\pi(r+4)^2 - \pi(r)^2 = 1125(\pi r^2)$

$$r^2 + 8r + 16 - r^2 = 1125r^2$$

$$11r^2 - 200r - 400 = 0$$

Solving $r = 20$

5) A survey of n people in the town of badaville found that 50% of them prefer brand A. Another survey of 100 people in the town of chottaville found that 60% prefer brand A. In total 55% of all the people surveyed together prefer Brand A. What is the total number of people surveyed?

$$\text{Sol: } 50\% (n) + 60\% (100) = 55\% (n + 100)$$

Solving we get $n = 100$

6) In the simple subtraction problem below some single digits are replaced by letters. Find the value of

$7A + 5D + 6CD$?

$A5C5$

$-1B87$

$674D$

$$\text{Sol: } 15 - 7 = 8 \text{ So } D = 8$$

$$10 + (C - 1) - 8 = 4 \text{ So } C = 3$$

$$10 + (5 - 1) - B = 7 \text{ So } B = 7$$

$$(A - 1) - 1 = 6 \text{ So } A = 8$$

$$7A + 5D + 6CD = 56 + 40 + 144 = 240$$

7) Two full tanks one shaped like the cylinder and the other like a cone contain liquid fuel the cylindrical tank held 500 lts more than the conical tank After 200 lts of fuel is pumped out from each tank the cylindrical tank now contains twice the amount of fuel in the conical tank How many lts of fuel did the cylindrical tank have when it was full?

Ans: Let the cylindrical tank capacity $x + 500$ then the conical tank capacity = x

After 200 lts pumped out, then remaining fuel with the tanks = $x + 300, x - 200$

Given that first term is double the second.

$$x + 300 = 2(x - 200)$$

Solving we get $x = 700$

Cylindrical tank capacity = 1200 lts

8. A shop sells chocolates It is used to sell chocolates for Rs.2 each but there were no sales at that price. When it reduced the price all the chocolates sold out enabling the shopkeeper to realize Rs 164.90 from the chocolates alone If the new price was not less than half the original price quoted How many chocolates were sold?

$$\text{Sol: } 164.90 = 2 \times 5 \times 17 \times 97$$

Now new chocolate price should be greater than 1 and less than 2. So $2 \times 5 \times 17 = 170$

So Total chocolates sold = 97 and New chocolate price = Rs.1.7

9) Eesha bought two varieties of rice costing 50Rs per kg and 60 Rs per kg and mixed them in some ratio. Then she sold that mixture at 70 Rs per kg making a profit of 20 % What was the ratio of the mixture?

Sol: Selling price of the mixture = 70 and profit = 20%

$$\text{Cost price of the mixture} = \frac{70 \times 100}{120} = 58.33$$

By applying alligation rule:

$$\begin{array}{ccc}
 50 & & 60 \\
 & \searrow \quad \swarrow & \\
 & 70 \times \frac{5}{6} & \\
 & \swarrow \quad \searrow & \\
 60 - \left(\frac{175}{3}\right) & & \left(\frac{175}{3}\right) - 50
 \end{array}$$

So ratio = $60 - 175/3 : 175/3 - 50 = 1 : 5$

10. Star question:

If $f(1)=4$ and $f(x+y)=f(x)+f(y)+7xy+4$, then $f(2)+f(5)=?$

Sol: Let $x=1$ and $y=1$

$$f(1+1) = f(1) + f(1) + 7 \times 1 \times 1 + 4 \Rightarrow f(2) = 19$$

Let $x=2$ and $y=2$

$$f(2+2) = 19 + 19 + 7 \times 2 \times 2 + 4 \Rightarrow f(4) = 70$$

Let $x=1$ and $y=4$

$$f(1+4) = 4 + 70 + 28 + 4 = 106$$

$$f(2) + f(5) = 125$$

TCS Latest Placement Paper Questions with solutions -2014 (13)

1. If $f(f(n))+f(n)=2n+3$ and $f(0)=1$, what is the value of $f(2012)$?

a) 2011

b) 2012

c) 2013

d) 4095

Ans: Option C

Put $n = 0$

Then $f(f(0)) + f(0) = 2(0) + 3 \Rightarrow f(1) + 1 = 3 \Rightarrow f(1) = 2$

Put $n = 1$

$f(f(1)) + f(1) = 2(1) + 3 \Rightarrow f(2) + 2 = 5 \Rightarrow f(2) = 3$

Put $n = 2$

$f(f(2)) + f(2) = 2(2) + 3 \Rightarrow f(3) + 3 = 7 \Rightarrow f(3) = 4$

.....

$f(2012) = 2013$

2. If $5+3+2=151022$, $9+2+4=183652$, then $7+2+5=?$

Ans: 143547

If the given number is $a + b + c$ then $a.b \mid a.c \mid a.b + a.c - b$

$\Rightarrow 5+3+2 = 5.3 \mid 5.2 \mid 5.3 + 5.2 - 3 = 151022$

$\Rightarrow 9+2+4 = 9.2 \mid 9.4 \mid 9.2 + 9.4 - 2 = 183652$

$7+2+5 = 7.2 \mid 7.5 \mid 7.2 + 7.5 - 2 = 143547$

3. The savings of employee equals income minus expenditure. If the income of A, B, C are in the ratio 1:2:3 and their expense ratio 3:2:1 then what is the order of the employees in increasing order of their size of their savings?

Ans: $A < B < C$

As the ratio of their incomes are in ascending order, and their expenses are in descending order, their savings also in their incomes order.

So savings order = $A < B < C$

4. Entry fee is Re.1. there are 3 rides each is of Re.1. total boys entering are 3000. total income is Rs.7200. 800 students do all 3 rides. 1400 go for atleast 2 rides. none go the same ride twice. then no of students who do not go any ride is?

Ans: 1000

Total entries are 3000 So fee collected through entry fee = $3000 \times 1 = \text{Rs.}3000$

Income generated through rides = $7200 - 3000 = 4200$

Now 800 went for 3 rides so total fee paid by these 800 = $800 \times 3 = 2400$

$(1400 - 800)$ went for 2 rides so fee paid by these 600 = $600 \times 2 = 1200$

Assume K went for exactly 1 ride

Then $K \times 1 + 1200 + 2400 = 4200 \Rightarrow K = 600$

So number of boys who did not go for any ride = $3000 - (600 + 600 + 800) = 1000$

5. The average mark obtained by 22 candidates in an examination is 45. The average of the first ten is 55 while the last eleven is 40 .The marks obtained by the 11th candidate is ?

Ans: 0

It is clear that $22 \times 45 = 10 \times 55 + K + 11 \times 40 \Rightarrow K = 0$

6. What is the largest positive integer n for which 3^n divides 44^{44} ?

Ans: n = 0

The digit sum of 44^{44} is when remainder obtained 44^{44} divided by 9

$$44^{44} = (45-1)^{44}$$

Each term is a multiple of 9 but the last term which is $(-1)^{44} = 1$

So the digit sum of 44^{44} is 1.

Now the divisibility rule for 3, 9, 27... is the sum of the digits should be divisible by 3, 9, 27

respectively. In each case the digit sum is either multiple of 3 or 9.

So for any value of $n > 1$, the given expression is not divisible by 3^n

7. $1(1!)+2(2!)+3(3!)....2012(2012!) = ?$

Ans: $2013! - 1$

$$1(1!)=1 \Rightarrow 2!-1$$

$$1(1!)+2(2!)=1+4=5 \Rightarrow 3!-1$$

$$1(1!)+2(2!)+3(3!)=1+4+18=23 \Rightarrow 4!-1$$

.....

.....

$$1(1!)+2(2!)+3(3!)+\dots+2012(2012!)=2013!-1$$

TCS Latest Placement Paper Questions with solutions -2014 (15)

1. A man is known to speak truth 3 out of 4 times. He throws die and reports that it is a 6. The probability that it is actually a 6 is

Sol: If 6 actually appeared, he can report it with the probability of 3/4. If 6 has not appeared, still he can report it wrongly with the probability of 1/4

So the probability that it is actually a 6 = (Probability to appear 6 x His truthfulness to report + Probability to appear any other number x His lying probability) = $16 \times 34 + 56 \times 14 = 13$

The probability that it is actually 6 = Probability that he reports 6 / Total probability to appear

$$6 = \frac{34 \times 16}{34 \times 16 + 14 \times 56} = \frac{3}{8}$$

2. In how many ways can we distribute 10 pencils to 4 children so each child gets atleast one pencil?

Number of ways of distributing r identical objects to n distinct objects so that each get atleast one

$$= {}^{(n-1)}C_{(r-1)} = {}^{(10-1)}C_{(4-1)} = {}^9C_3$$

3. A drawer holds 4 red hats and 4 blue hats. what is probability of getting exactly 3 red hats or 3 blue hats when taking out 4 hats randomly out of drawer and immediately returning every hat to drawer before taking out next??

As the objects are replaced, the probability of drawing red or blue is equal.

Probability to draw exactly 3 red hats and 1 blue hat = $12 \times 12 \times 12 \times 12 = 116$

Similarly probability to draw exactly 3 blue hats and 1 red hat = $12 \times 12 \times 12 \times 12 = 116$

Total probability = $116 + 116 = 18$

4. A father purchased dress for his 3 daughters. The dresses are of same color but diff size and they are kept in dark room. what is probability that all the 3 will not choose their own dress?

This is a case of de-arrangements = $D_n = n!(12! - 13! + 14! - \dots)$

So number of ways that none of them chooses their own dress = $D_3 = 3!(12! - 13!) = 2$

So probability = $2/3! = 1/3$

5. 60% of male in a town and 70% of female in a town are eligible to vote. out of which 70% of male and 60% of female who are eligible to vote voted for candidate A. what is the value of votes in % did A get?

Let the ratio of men and women are 100 : k

Male eligible votes = 60 and female eligible votes = 70% (k)

Number of males who voted for A = 70% (60) = 42

Number of females who voted for A = 60%(70% (K) = 42% (k)

Percentage of votes got by A = $42 + 42 \frac{100(K)}{60 + 70 \frac{100(K)}{100}} \times 100 = 4200 + 42K \frac{100}{6000 + 70K} \times 100$

So this value cannot be determined as the value of K is not known

6. George and Mark can paint 720 boxes in 20 days. Mark and Harry in 24 days and Harry and George in 15 days. George works for 4 days, Mark for 8 days and Harry for 8 days. The total number of boxes painted by them is

Capacity of G + M = $720 / 20 = 36$

M + H = $720 / 24 = 30$

H + G = $720 / 15 = 48$

Combined capacity = $2 (G + H + M) = 114$

$$G + H + M = 114 / 2 = 57$$

$$\text{Now capacity of G} = (G+H+M) - (H + M) = 57 - 30 = 27$$

$$M = (G+H+M) - (H + G) = 57 - 48 = 9$$

$$H = (G+H+M) - (G + M) = 57 - 36 = 21$$

Given that G worked for 4 days, and mark for 8 and harry for 8 days

$$\text{So total work by them} = 4 \times 27 + 8 \times 9 + 8 \times 21 = 348$$

7. Two equilateral triangle of side 12cm are placed one on top another, such a 6 pointed star is formed if the six vertices lie on a circle what is the area of the circle not enclosed by the Star?

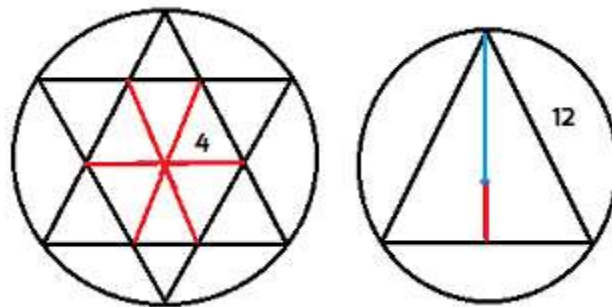
a)61

b)57

c)68

d)83

Sol: Given that two equilateral triangles of length 12 has inscribed in a circle.



$$\text{Altitude of the triangle} = \frac{\sqrt{3}}{2}a = \frac{\sqrt{3}}{2}(12) = 6\sqrt{3}$$

We know that centroid divides the altitude in the ratio 2 : 1 and $\frac{2}{3}(\text{Altitude}) = \text{Circum radius}$

$$\text{Circum radius} = \frac{2}{3}(6\sqrt{3}) = 4\sqrt{3}$$

$$\text{Area of the circle} = \pi r^2 = 3.14 \times (4\sqrt{3})^2$$

Now the two triangles in the circle forms 12 small equilateral triangles with side 4. So their total area

$$= 12 \times 3\sqrt{4a^2} = 12 \times 3\sqrt{44^2}$$

$$\text{Area which is not covered by the equilateral triangles} = 3.14 \times (43\sqrt{2})^2 - 12 \times 3\sqrt{44^2} = 67.65 \approx 68$$

8. There are 4 different letters and 4 addressed envelopes. In how many ways can the letters be put in the envelopes so that atleast one letter goes to the correct address ?

a)15 b)16 c)18 d)12

Total ways of putting r letters to r covers = $r! = 4! = 24$

Number of ways that none of them goes into the right envelope = $D_4 = 4!(12! - 13! + 14!) = 9$

So atleast one envelope goes into the right one = $24 - 9 = 15$

9. There are 250 men and 150 women in a committee, if all will work they will complete 12 units per day, if all men work they will complete 15 units per day, how many units will women complete per day?

I think there is a mistake in this question. If all men and women together complete 12 units, how only men can do 15 Units of work a day?

Forgetting about the reality, Women can do -3 units a day.

10. How many odd and even numbers are there between 42 and 400?? Find the sum of odd numbers and the sum of even numbers!

Sol: Odd numbers are from 43 to 399. Number of odd numbers = $1 - a + 1 = 399 - 43 + 1 = 179$

Their sum = $n/2(1+a) = 39559$

Even numbers are from 44 to 398. Number of even numbers = $1 - a + 1 = 398 - 44 + 1 = 178$

Their sum = $178(398+44)/2 = 39338$

11. The famous church in the city of Kumbakonam has a big clock tower and is said to be over 300 years old. Every Monday 10.00 A M the clock is set by Antony, doing service in the church. The Clock loses 6 mins every hour. What will be the actual time when the faulty clock shows 3 P.M on Friday?

a. 4 AM

b. 3.16 PM

c. 4.54 AM

d. 3 AM

Total time passed in the faulty clock = Monday 10 am to Friday 3 pm = $24 \times 4 + 5$ hours = 96 and 5 hours
= 101 hrs

54 min in the faulty clock = 60 minutes of the correct clock

101 hrs in the faulty clock = ?

$101 \times \frac{60}{54} = 112.2$ Hrs.

96 Hrs + 16.2 Hrs

Friday 10 am + 16 hrs = Saturday 2am

0.2×60 min = 12 min

So Saturday 2.12 min AM

12. Suresh Raina and Gautam Gambhir after a scintillating IPL match decide to travel by cycle to their respective villages. Both of them start their journey travelling in opposite directions. Each of their speeds is 6 miles per hour. When they are at a distance of 50 miles, a housefly starts flying from Suresh Raina's cycle towards Gautam Gambhir at a relative speed of 17 miles per hour with respect to Raina's speed.

What will be the time taken by housefly to reach Gambhir?

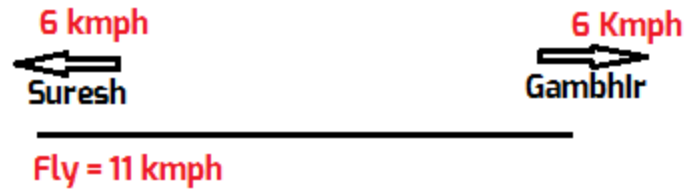
a. 10 hrs

b. 15 hrs

c. 20 hrs

d. 25 hrs

Sol:



Fly speed is 17 kmph w.r.t to suresh as fly is moving in opposite direction to suresh, its actual speed is $17 - 6 = 11$.

Now relative speed of fly and gambhir = $11 - 6 = 5$ kmph

So fly takes = $50 / 11 - 6 = 10$ Hrs

TCS Latest Placement Paper Questions with solutions -2014 (16)

1. The value of diamond varies directly as the square of its weight. If a diamond falls and breaks into two pieces with weights in the ratio 2:3. what is the loss percentage in the value?

Sol: Let weight be "x"

the cost of diamond in the original state is proportional to x^2

when it is fallen it breaks into two pieces $2y$ and the $3y$

$$x = 5y$$

$$\text{Original value of diamond} = (5y)^2 = 25y^2$$

$$\text{Value of diamond after breakage} = (2y)^2 + (3y)^2 = 13y^2$$

$$\text{so the percentage loss will be} = \frac{25y^2 - 13y^2}{25y^2} \times 100 = 48\%$$

2. Five college students met at a party and exchanged gossips. Uma said, "Only one of us is lying". David said, "Exactly two of us are lying". Thara said, "Exactly 3 of us are lying". Querishi said, "Exactly 4 of us are lying". Chitra said "All of us are lying". Which one was telling the truth?

a) David

b) Querishi

c)Chitra

d)Thara

Sol: As all are contradictory statements, it is clear that ONLY one of them is telling the truth. So remaining 4 of them are lying. Querishi mentioned that exactly 4 are lying. So, he is telling the truth.

Explanation: Let us 1st assume that Uma is telling the truth. Then according to her only one is lying. But if only one is lying then all the others' statements are contradicting the possibility. In the same way all the other statements should be checked. If we assume the Querishi is telling the truth, according to him exactly 4 members are lying. So all the others are telling lies and he is the one who is telling the truth. This case fits perfectly.

3. Cara, a blue whale participated in a weight loss program at the biggest office. At the end of every month, the decrease in weight from original weight was measured and noted as 1, 2, 6, 21, 86, 445, 2676. While Cara made a steadfast effort, the weighing machine showed an erroneous weight once. What was that.

a) 2676

b) 2

c) 445

d) 86

SOL: This is a number series problem nothing to do with the data given.

$$1 \times 1 + 1 = 2$$

$$2 \times 2 + 2 = 6$$

$$6 \times 3 + 3 = 21$$

$$21 \times 4 + 4 = 88 \text{ and not } 86$$

$$88 \times 5 + 5 = 445$$

$$445 \times 6 + 6 = 2676$$

4. The letters in the word ADOPTS are permuted in all possible ways and arranged in alphabetical order

then find the word at position 42 in the permuted alphabetical order?

a) AOTDSP

b) AOTPDS

c) AOTDPS

d) AOSTPD

SOL:

In alphabetical order : A D O P S T

A _ _ _ _ : the places filled in $5! = 120$, But we need a rank less than 120. So the word starts with A.

A D _ _ _ : empty places can be filled in $4! = 24$

A O _ _ _ : the places filled with $4!$ ways = 24. If we add $24 + 24$ this total crosses 42. So We should not consider all the words starting with AO.

A O D _ _ : $3! = 6$

A O P _ _ : $3! = 6$

Till this 36 words are obtained, we need the 42nd word.

AOS _ _ : $3! = 6$

Exactly we are getting the sum 42. So last 3 letters in the descending order are TPD.

So given word is AOSTPD

4. A man who goes to work long before sunrise every morning gets dressed in the dark. In his sock drawer he has 6 black and 8 blue socks. What is the probability that his first pick was a black sock, but his second pick was a blue sock?

SOL: This is a case of without replacement. We have to multiply two probabilities. 1. Probability of picking up a black sock, and probability of picking a blue sock, given that first sock is black.

$${}^6C_1 {}^{14}C_1 \times {}^8C_1 {}^{13}C_1 = 2491$$

5. There are 6 red balls, 8 blue balls and 7 green balls in a bag. If 5 are drawn with replacement, what is the probability at least three are red?

Sol: At least 3 reds means we get either : 3 red or 4 red or 5 red. And this is a case of replacement.

case 1 : 3 red balls : $\frac{6}{21} \times \frac{6}{21} \times \frac{6}{21} \times \frac{15}{21} \times \frac{15}{21}$

case 2 : 4 red balls : $\frac{6}{21} \times \frac{6}{21} \times \frac{6}{21} \times \frac{6}{21} \times \frac{15}{21}$

case 3 : 5 red balls : $\frac{6}{21} \times \frac{6}{21} \times \frac{6}{21} \times \frac{6}{21} \times \frac{6}{21}$

$$\begin{aligned}\text{Total probability} &= \left(\frac{6}{21} \times \frac{6}{21} \times \frac{6}{21} \times \frac{15}{21} \times \frac{15}{21} \right) + \left(\frac{6}{21} \times \frac{6}{21} \times \frac{6}{21} \times \frac{6}{21} \times \frac{15}{21} \right) + \left(\frac{6}{21} \times \frac{6}{21} \times \frac{6}{21} \times \frac{6}{21} \times \frac{6}{21} \right) \\ &= \frac{312}{16807}\end{aligned}$$

6. Total number of 4 digit number do not having the digit 3 or 6.

Sol:

consider 4 digits _ _ _ _

1st blank can be filled in 7C_1 ways (0,3,6 are neglected as the first digit should not be 0)

2nd blank can be filled in 8C_1 ways (0 considered along with 1,2,4,5,7,8,9)

3rd blank can be filled in 8C_1 ways

4th blank can be filled in 8C_1 ways

Therefore total 4 digit number without 3 or 6 is $7 \times 8 \times 8 \times 8 = 3584$

7. Find the missing in the series: 70, 54, 45, 41, ____.

Sol: 40

$$70 - 54 = 16 = 4^2$$

$$54 - 45 = 9 = 3^2$$

$$45 - 41 = 4 = 2^2$$

$$41 - 40 = 1 = 1^2$$

8. 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?

Sol: We have to find the maximum number which divides all the given numbers so that number of roots get minimized. HCF of 120,192 & 144 is 24. Each room have 24 students of the same course.

Then rooms needed $\frac{120}{24} + \frac{192}{24} + \frac{144}{24} = 5 + 8 + 6 = 19$

9. A farmer has a rose garden. Every day he picks either 7,6,24 or 23 roses. When he plucks these number of flowers the next day 37,36,9 or 18 new flowers bloom. On Monday he counts 189 roses. If he continues on his plan each day, after some days what can be the number of roses left behind? (Hint : Consider number of roses remaining every day)

a)7

b)4

c)30

d)37

Sol:

let us consider the case of 23. when he picks up 23 roses the next day there will be 18 new, so in this case., 5 flowers will be less every day. So when he counts 189, the next day 184, 179,174,169,..... finally the no. of roses left behind will be 4.

10. What is the 32nd word of "WAITING" in a dictionary?

Sol: Arranging the words of waiting in Alphabetical Order : A,G,I,I,I,N,T,W

Start with A _ _ _ _ _ This can be arranged in $\frac{6!}{2!}$ ways= $\frac{720}{2}$ =360 ways

so can't be arranged starting with A alone as it is asking for 32nd word so it is out of range

AG _ _ _ _ then the remaining letters can be arranged in $\frac{5!}{2!}$ ways so, $\frac{120}{2}$ =60 ways. Out of range as it has to be within 32 words.

AGI _ _ _ Now the remaining letters can be arranged in 4! ways =24

AGN _ _ _ _ can be arranged in $4!/2!$ ways or 12 ways

so, $24+12=36$ th word so out of range. So we should not consider all the words start with AGN

now AGNI _ _ _ can be arranged in $3!$ ways = 6 ways

so $24+6=30$ within range

Now only two word left so, arrange in alphabetical order.

AGNTIIW - 31st word

AGNTIWI - 32nd word

TCS Latest Placement Paper Questions with solutions -2014 (17)

1. A manufacturer of chocolates makes 6 different flavors of chocolates. The chocolates are sold in boxes of 10.

How many “different” boxes of chocolates can be made?

Sol:

If n similar articles are to be distributed to r persons, $x_1+x_2+x_3+\dots+x_r=n$ each person is eligible to take any number of articles then the total ways are ${}^{n+r-1}C_{r-1}$

In this case $x_1+x_2+x_3+\dots+x_6=10$

in such a case the formula for non negative integral solutions is ${}^{n+r-1}C_{r-1}$

Here $n=6$ and $r=10$. So total ways are ${}^{10+6-1}C_{6-1} = {}^{15}C_5 = 3003$

2. In a single throw with two dice, find the probability that their sum is a multiple either of 3 or 4.

a. $1/3$

b. $1/2$

c. $5/9$

d. $17/36$

Sol: Their sum can be 3,4,6,8,9,12

For two dice, any number from 2 to 7 can be get in $(n-1)$ ways and any number from 8 to 12 can be get in $(13 - n)$ ways.

Then possible ways are $2 + 3 + 5 + 5 + 4 + 1 = 20$ possible cases.

So probability is $(20/36)=(5/9)$

3. B alone can do piece of work in 10 days. A alone can do it in 15 days. If the total wages for the work is Rs 5000, how much should B be paid if they work together for the entire duration of the work?

a. 2000

b. 4000

c. 5000

d. 3000

Sol:

Time taken by A and B is in the ratio of = 3:2

Ratio of the Work = 2 : 3 (since, time and work are inversely proportional)

Total money is divided in the ratio of 2 : 3 and B gets Rs.3000

4. On a 26 question test, 5 points were deducted for each wrong answer and 8 points were added for right answers. If all the questions were answered how many were correct if the score was zero.

a. 10

b. 11

c. 13

d. 12

Sol:

Let x ques were correct. Therefore, (26- x) were wrong

$$8x - 5(26 - x) = 0$$

Solving we get $x=10$

5. Arun makes a popular brand of ice cream in a rectangular shaped bar 6cm long, 5cm wide and 2cm thick. To cut costs, the company had decided to reduce the volume of the bar by 19%. The thickness will remain same, but the

length and width will be decreased by some percentage. The new width will be,

a. 5.5

b. 4.5

c. 7.5

d. 6.5

Sol:

$$\text{Volume} = l \times b \times h = 6 \times 5 \times 2 = 60 \text{ cm}^3$$

Now volume is reduced by 19%.

$$\text{Therefore, new volume} = (100 - 19)100 \times 60 = 48.6$$

Now, thickness remains same and let length and breadth be reduced to $x\%$

$$\text{so, new volume: } (x100 \times 6)(x100 \times 5)2 = 48.6$$

Solving we get $x = 90$

thus length and width is reduced by 10%

$$\text{New width} = 5 - (10\% \text{ of } 5) = 4.5$$

6. If all the numbers between 11 and 100 are written on a piece of paper. How many times will the number 4 be used?

Sol: We have to consider the number of 4's in two digit numbers. _ _

If we fix 4 in the 10th place, unit place be filled with 10 ways. If we fix 4 in units place, 10th place be filled with 9 ways (0 is not allowed)

So total 19 ways.

Alternatively:

There are total 9 4's in 14, 24, 34..., 94

& total 10 4's in 40, 41, 42.... 49

thus, $9 + 10 = 19$.

7. If twenty four men and sixteen women work on a day, the total wages to be paid is 11,600. If twelve men and

thirty seven women work on a day, the total wages to be paid remains the same. What is the wages paid to a man for a day's work?

Sol: Let man daily wages and woman daily wages be M and W respectively

$$24M + 16W = 11600$$

$$12M+37W=11600$$

solving the above equations gives $M=350$ and $W=200$

8. The cost price of a cow and a horse is Rs 3 lakhs. The cow is sold at 20% profit and the horse is sold at 10% loss.

Overall gain is Rs 4200. What is the cost price of the cow?

Sol:

$$\text{Profit} = 4200$$

$$\text{Profit} = \text{SP} - \text{CP}$$

4200=SP - 300000 therefore SP=304200

$$x+y = 300000$$

$$1.2x + 0.9y = 304200$$

Solving for $x = 114000 = \text{CP of cow.}$

9. 1, 2, 2, 3, 3, 3, 4, 4, 4, 4, 1, 1, 2, 2, 2, 2, 3, 3, 3, 3, 3, 3, 4, 4, 4, 4, 4, 4, 1, 1, 1, 2, 2, 2, 2, 2, 3, 3, 3, 3, 3, 3, 3, 3, 3, 3, 4.....

In the above sequence what is the number of the position 2888 of the sequence.

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

Sol: First if we count 1223334444. they are 10

In the next term they are 20

Next they are 30 and so on

So Using $n(n+1)2 \times 10 \leq 2888$

For $n = 23$ we get LHS as 2760. Remaining terms 128.

Now in the 24th term, we have 24 1's, and next 48 terms are 2's. So next 72 terms are 3's.

The 2888 term will be "3".

10. How many 4-digit numbers contain no.2?

Sol: Total number of four digit numbers = 9000 (i.e 1000 to 9999)

We try to find the number of numbers not having digit 2 in them.

Now consider the units place it can be selected in 9 ways (i.e 0,1,3,4,5,6,7,8,9)

Tens place it can be selected in 9 ways (i.e 0,1,3,4,5,6,7,8,9)

Hundreds place it can be selected in 9 ways (i.e 0,1,3,4,5,6,7,8,9)

Thousands place can be selected in 8 ways (i.e 1,3,4,5,6,7,8,9) here '0' cannot be taken

Total number of numbers not having digit 2 in it = $9 \times 9 \times 9 \times 8 = 5832$

Total number of numbers having digit 2 in it = $9000 - 5832 = 3168$

TCS Latest Placement Paper Questions with solutions -2014 (18)

1. 2ab5 is a four digit number divisible by 25. If a number formed from the two digits ab is a multiple of 13, then ab is

a. 52

b. 45

c. 10

d. 25

Sol: For a number to be divisible by 25, last two digits of that number should be divisible by 25. So b must be either

2 or 7

it is given that ab must be divisible by 13 and in the options only 52 is divisible by 13.

2. The average temperature of Tuesday Wednesday and Thursday was 37 C. The average temperature of Wednesday and Thursday and Friday was 38 C. if the temperature on Friday was 39 C.

Find the temperature on Tuesday.

a. 37.33

b. 38.33

c. 36

d. None of the above

Sol:

$$(\text{Tues} + \text{Wed} + \text{Thurs})/3=37$$

$$\text{Tues} + \text{Wed} + \text{Thurs}=111...(1)$$

$$(\text{Wed} + \text{Thurs} + \text{Fri})/3=38$$

$$(\text{Wed} + \text{Thurs} + \text{Fri}) =114...(2)$$

Given friday is 39.

$$\text{Then, } (2) - (1) \text{ Fri} - \text{Tues} = 3$$

$$\text{So } 39 - \text{Tues} = 3$$

$$\text{Tuesday} =36$$

3. There are 5 boxes in a cargo. The weight of the 1st box is 200 KG, the weight of the 2nd box is 20% higher than the third box, whose weight is 25% higher than the 1st box weight. The 4th box which weighs 350 KG is 30% lighter than the 5th box. Find the difference in average weight of the 4 heaviest boxes and the four lightest boxes.

Sol: weight of 1st box=200

$$\text{weight of 3rd box}=(125/100)*200=250$$

$$\text{weight of 2nd box}=(120/100)*250=300$$

$$\text{weight of 4th box} =350$$

weight of 5th box = $(10/7) \times 350 = 500$

average of 4 highest weighted boxes = $(500 + 350 + 300 + 250)/4 = 350$

average of 4 lightest boxes = $(350 + 300 + 250 + 200)/4 = 275$

therefore difference = $350 - 275 = 75$

4. 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 4 walls of the room will be decreased by

a. 30%

b. 18.75%

c. 15%

d. 13.6%

Sol: Given $l:b:h = 3:2:1$

let $h=10$, $b = 20$, and $l = 30$

area = $2(l+b)h$

area = $2 \times (30+20) \times 10 = 1000$

Now after those adjustments in the measurements,

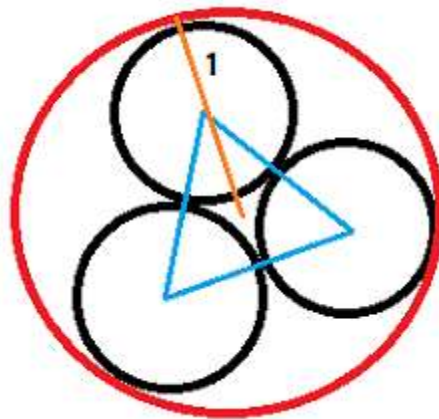
$l=60$, $b=10$, $h=5$

area = $2(l+b)h = 2(60+10)5 = 700$

Percentage decrease = $\frac{1000 - 700}{1000} \times 100 = 30\%$

5. A circle circumscribes three unit circles that touch each other. What is the area of the larger circle? Note that π is the ratio of the circumference to the diameter of a circle (3.14159265).

Sol:



By joining centers of 3 unit circles we will get an equilateral triangle of length 2 unit. We have to find the length of the orange line.

And center of the equilateral triangle will be the center of the big circle.

So radius of the big circle will be = (1 + Circum radius of the equilateral triangle)

Formula for Circum radius of the equilateral triangle = $\frac{2}{3} \times (3\sqrt{2}a)$ here $3\sqrt{2}a$ is the height of the triangle. a is the side of the triangle

Circum radius of equilateral triangle = $\frac{2}{3} \times 3\sqrt{2} \times 2 = 2\sqrt{3}$

Area of big circle will be $= \pi r^2 = 3.14 \times (1 + 2\sqrt{3})^2 = 3.14 \times (1 + 4\sqrt{3} + 12)$

$= 3.14 \times (13 + 4\sqrt{3}) = 3.14 \times (13 + 6.928)$

$= 3.14 \times (19.928)$

6. Rajesh calculated his average over the last 24 tests and found it to be 76. He finds out that the marks for three tests have been inverted by mistake. The correct marks for these tests are 87, 79 and 98. What is the approximate percentage difference between his actual average and his incorrect average?

Sol: No Change

Incorrect value is: 78, 97, 89

correct values are: 87, 79, 98

difference between correct and incorrect value is $= 9 + 9 - 18 = 0$

7. Joke is faster than Paul, Joke and Paul each walk 24 KM. The sum of their speed is 7 Km per hour. And the sum of times taken by them is 14 hours. Then, Joke speed is

- a. 3 KM/Hr
- b. 4 KM/Hr
- c. 5 KM/Hr
- d. 7 KM/Hr

Sol:

Speed=Distance/Time

let the speed of joke x then speed of paul will be 7-x

$$24/x + 24/(7-x) = 14$$

Try to plugin the values from the options. If Joke speed is 4 the paul is 3.

8. The crew of a rowing team of 8 members is to be chosen from 12 men (M1, M2, ..., M12) and 8 women (W1, W2, ..., W8), such that there are two rows, each row occupying one the two sides of the boat and that each side must have 4 members including at least one women. Further it is also known W1 and M7 must be selected for one of its sides while M2, M3 and M10 must be selected for other side. What is the number of ways in which rowing team can be arranged.

SoL:

We need two person for one side and 1 women for the another side. We select that women in 7 ways. Now that second side people can sit in $7 \times 4!$ ways.

Now for the first side we need two people from the remaining 14. So this can be done in ${}^{14}C_2$ ways and this side people can sit in ${}^4C_2 \times 4!$ ways.

Again the first group may take any of the two sides. So total ways are $2 \times 7 \times 4! \times {}^{14}C_2 \times 4!$

9. In a certain city, 60% of the registered voters are congress supporters and the rest are BJP supporters. In an assembly election, if 75% of the registered congress supporters and 20% of the registered BJP supporters are expected to vote for candidate A, what percent of the registered voters are expected to vote for candidate A?

Sol: let the people in the city be 100

Congress supporters = 60% of 100 = 60

40% are BJP = 40% of 100 = 40

out of 60, 75% voted for congress = $75\%(60) = 45$

out of 40, 20% voted for congress = $20\%(40) = 8$

Total = $45 + 8 = 53$

Total percent = 53%

10. Anusha, Banu and Esha run a running race of 100 meters. Anusha is the fastest followed by Banu and then Esha. Anusha, Banu and Esha maintain constant speeds during the entire race. When Anusha reached the goal post, Banu was 10m behind. When Banu reached the goal post Esha was 10m behind. How far was behind Anusha when the latter reached the goal post.

option

a) 70

b) 81

c) 90

d) 80

Sol:

By that time Anusha covered 100m, Banu covered 90m. So ratio of their speeds = 10 : 9

By that time Banu reached 100m, Esha covered 90m. So ratio of their speeds = 10 : 9

Ratio of the speed of all the three = 100 : 90 : 81

By that time Anusha covered 100m, Esha covers only 81.

11. Seven different objects must be divided among three persons. In how many ways this can be done if at least one of them gets exactly one object.

Sol: Division of $m+n+p$ objects into three groups is given by $(m+n+p)!/m! \times n! \times p!$

But $7 = 1 + 3 + 3$ or $1 + 2 + 4$ or $1 + 1 + 5$

So The number of ways are $(7)!1!\times 3!\times 3!\times 12! + (7)!1!\times 2!\times 4! + (7)!1!\times 1!\times 5!\times 12! = 70 + 105 + 21 = 196$

12. George while driving along the highway saw road markers which are at equal distances from each other. He crosses the markers every 20 seconds. If he increases his speed by x meters per second, he crosses the markers at every 15 seconds. But if he increases his speed by y meters per second, he crosses the marker at every 10th second. If $y - x = 40$ meters per second, then what is the distance between two markers.

Sol: Let speed be $=z$ m/s then Distance $= 20z$ m

$$(z+x)15=20z; (z+y)10=20z$$

Also given that $y - x = 40$

solving we get $20z=1200$

13. How many different 9 digit numbers can be formed from the number 223355888 by re-arranging its digits so that the odd digits occupy even position?

Sol: Odd places are 4 and these are occupied by 3355. So this can be done in $4!/(2!2!) = 6$

There are 5 even numbers which have to be placed at 5 odd places. So $5!/(2!3!) = 10$ ways

so total number of ways of arranging all these numbers are $10 * 6 = 60$ ways

14. In a vessel, there are 10 litres of alcohol. An operation is defined as taking out five litres of what is present in the vessel and adding 10 litres of pure water to it. What is the ratio of alcohol to water after two operations?

a) 1 : 5

b) 2 : 3

c) 1 : 6

d) 3 : 2

Sol: Final concentration = Initial concentration $(1 - \frac{\text{replacement quantity}}{\text{final volume}})$

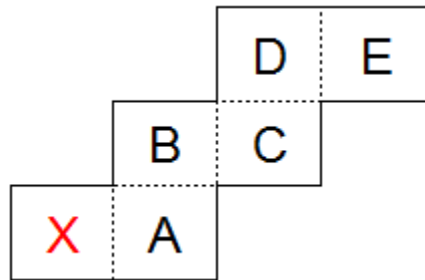
$$\text{Final concentration} = 1 \times (1 - \frac{10}{15}) = \frac{2}{3}$$

$$\text{Final concentration} = \frac{2}{3} \times (1 - \frac{10}{20}) = \frac{1}{3}$$

So ratio of alcohol : water = 1 : 5

TCS latest Placement paper Questions - 2015 (19)

1. The figure shown can be folded into the shape of a cube. In the resulting cube, which of the lettered faces is opposite the face marked x?



a. c

b. a

c. d

d. b

Ans: a

Explanation: If you fold the above picture at the dotted lines, X and C are opposite to each other.

2. In how many ways a team of 11 must be selected from 5 men and 11 women such that the team must comprise of not more than 3 men?

a. 1565

b. 1243

c. 2256

d. 2456

Ans: C

Explanation;

The team may consist of 0 men + 11 women, 1 men + 10 women, 2 men + 9 women, or 3 men + 8 women.

So Number of ways are = ${}^{11}C_{11} + {}^5C_1 \times {}^{11}C_{10} + {}^5C_2 \times {}^{11}C_9 + {}^5C_3 \times {}^{11}C_8 = 2256$

3. Given that $0 < a < b < c < d$, which of the following the largest ?

a. $(c+d) / (a+b)$

b. $(a+d) / (b+c)$

c. $(b+c) / (a+d)$

d. $(b+d) / (a+c)$

Sol: A

Explanation: Take $a = 1$, $b = 2$, $c = 3$, $d = 4$. option A is clearly true.

4. Eesha bought 18 sharpeners for Rs.100. She paid 1 rupee more for each white sharpener than for each brown sharpener. What is the price of a white sharpener and how many white sharpener did she buy ?

a. Rs.5, 10

b. Rs.6, 10

c. Rs.5, 8

d. Rs.6, 8

Sol: B

Explanation: Just check the options. If she bought 10 white sharpeners at Rs.6 per piece, She has spent Rs.60 already. And with the remaining Rs.40, she bought 8 brown sharpeners at $40/8 = \text{Rs.}5$ which is Rs.1 less than White sharpener.

5.

			7				x				8		
--	--	--	---	--	--	--	---	--	--	--	---	--	--

The fourteen digits of a credit card are to be written in the boxes shown above. If the sum of every three consecutive digits is 18, then the value of x is :

a. 3

b. cannot be determined from the given information.

c. 2

d. 1

Sol : A

Explanation:

Let us assume right most two squares are a , b

Then Sum of all the squares = $18 \times 4 + a + b \dots\dots\dots (1)$

Also Sum of the squares before 7 = 18

Sum of the squares between 7, $x = 18$

and sum of the squares between x , $8 = 18$

So Sum of the 14 squares = $18 + 7 + 18 + x + 18 + 8 + a + b (2)$

Equating 1 and 2 we get $x = 3$

6. Four people each roll a four die once. Find the probability that at least two people will roll the same number ?

a. $5/18$

b. $13/18$

c. None of the given choices

d. $1295/1296$

Sol: B

Explanation:

The number of ways of rolling a dice where no two numbers probability that no one rolls the same number
 $= 6 \times 5 \times 4 \times 3$

Now total possibilities of rolling a dice = 6^4

The probability that a no one gets the same number = $6 \times 5 \times 4 \times 3 / 6^4 = 5/18$

So the probability that at least two people gets same number = $1 - 5/18 = 13/18$

7. Jake can dig a well in 16 days. Paul can dig the same well in 24 days. Jake, Paul and Hari together dig the well in 8 days. Hari alone can dig the well in

a. 96 days

b. 48 days

c. 32 days

d. 24 days

Sol:

Explanation: Simple one. Let the total work to be done is 48 meters. Now Jake can dig 3 mts, Paul can dig 2 mts a day. Now all of them combined dug in 8 days so per day they dug $48/8 = 6$ mts. So Of these 8 mts, Hari capacity is 1 mt.

So he takes $48 / 1 = 48$ days to complete the digging job.

Updated :

8. Eesha bought 18 sharpeners for Rs.100. She paid 1 rupee more for each white sharpener than for each brown sharpener. What is the price of a white sharpener and how many white sharpener did she buy ?

- a. Rs.5, 10
- b. Rs.6, 10
- c. Rs.5, 8
- d. Rs.6, 8

Ans:

Explanation: This question can be solved easily by going through options.

A. White sharpener total cost: $\text{Rs.}5 \times 10 = \text{Rs.}50$. Brown sharpeners cost = $\text{Rs.}4 \times 8 = 32$. Total cost is only Rs.82. Wrong option.

B. White sharpener total cost: $\text{Rs.}6 \times 10 = \text{Rs.}60$. Brown sharpeners cost = $\text{Rs.}5 \times 8 = 40$. Total cost is Rs.100. Correct option.

9. The sum of the digits of a three digit number is 17, and the sum of the squares of its digits is 109. If we subtract 495 from the number, we shall get a number consisting of the same digits written in the reverse order. Find the number.

- a. 773
- b. 683
- c. 944
- d. 863

Ans: D

Explanation: Check options. Sum of the squares should be equal to 109. Only Options B and D satisfying. When we subtract 495, only 863 becomes 368.

10. Mark told John "If you give me half your money I will have Rs.75. John said, "if you give me one third of your money, I will have Rs.75/- How much money did John have ?

- a. 45
- b. 60
- c. 48
- d. 37.5

Ans: B

Explanation: Let the money with Mark and John are M and J respectively.

Now

$$M + J/2 = 75$$

$$M/3 + J = 75$$

Solving we get $M = 45$, and $J = 60$.

11. Eesha has a wheat business. She purchases wheat from a local wholesaler of a particular cost per pound. The price of the wheat of her stores is \$3 per kg. Her faulty spring balance reads 0.9 kg for a KG. Also in the festival season, she gives a 10% discount on the wheat. She found that she made neither a profit nor a loss in the festival season. At what price did Eesha purchase the wheat from the wholesaler ?

- a. 3
- b. 2.5
- c. 2.43
- d. 2.7

Ans: C

Explanation: Faulty spring balance reads 0.9 kg for a kg" means that she sells 1 kg for the price of 0.9 kgs, so she loses 10% of the price because of the faulty spring balance. She loses another 10% because of the discount.

So, she actually sells 1 kg for $\$3 \times 0.9 \times 0.9 = \2.43 and since at that price she made neither a profit nor a loss, then Eesha purchase the wheat from the wholesaler for \$2.43.

12. Raj goes to market to buy oranges. If he can bargain and reduce the price per orange by Rs.2, he can buy 30 oranges instead of 20 oranges with the money he has. How much money does he have ?

- a. Rs.100
- b. Rs.50

c. Rs.150

d. Rs.120

Ans: D

Explanation: Let the money with Raj is M. So $M20 - M30 = 2$. Check options. Option D satisfies.

13. A city in the US has a basketball league with three basketball teams, the Aziecs, the Braves and the Celtics. A sports writer notices that the tallest player of the Aziecs is shorter than the shortest player of the Braves. The shortest of the Celtics is shorter than the shortest of the Aziecs, while the tallest of the Braves is shorter than the tallest of the Celtics. The tallest of the Braves is taller than the tallest of the Aziecs.

Which of the following can be judged with certainty ?

X) Paul, a Brave is taller than David, an Aziec

Y) David, a Celtic, is shorter than Edward, an Aziec

a. Both X and Y

b. X only

c. Y only

d. Neither X nor Y

Ans: B

Sol: We solve this problem by taking numbers. Let the shortest of Braves is 4 feet. Then tallest of Aziecs is less than 4. So let it be 3 feet.

A -> 2 - 3

B -> 4 - 6

C -> 1 - 7

From the above we can safely conclude X is correct. but Y cannot be determined.

14. There are 3 classes having 20, 24 and 30 students respectively having average marks in an examination as 20, 25 and 30 respectively. The three classes are represented by A, B and C and you have the following information about the three classes.

a. In class A highest score is 22 and lowest score is 18

- b. In class B highest score is 31 and lowest score is 23
- c. In class C highest score is 33 and lowest score is 26.

If five students are transferred from A to B, what can be said about the average score of A; and what will happen to the average score of C in a transfer of 5 students from B to C ?

- a. definite decrease in both cases
- b. can't be determined in both cases
- c. definite increase in both cases
- d. will remain constant in both cases

Ans: B

Explanation:

Class A average is 20. And their range is 18 to 22

Class B average is 25. And their range is 23 to 31

Class A average is 30. And their range is 26 to 33

If 5 students transferred from A to B, A's average cannot be determined but B's average comes down as the highest score of A is less than lowest score of B.

If 5 students transferred from B to C, C's average cannot be determined the B's range for marks and C's range of marks are overlapping.

15. The value of a scooter depreciates in such a way that its value at the end of each year is $\frac{3}{4}$ of its value at the beginning of the same year. If the initial value of the scooter is Rs.40,000, what is the value at the end of 3 years ?

- a. Rs.13435
- b. Rs.23125
- c. Rs.19000
- d. Rs.16875

Ans: D

Explanation: $40,000 \left(\frac{3}{4}\right)^3 = 16875$

16. Rajiv can do a piece of work in 10 days, Venky in 12 days and Ravi in 15 days. They all start the work together, but Rajiv leaves after 2 days and Venky leaves 3 days before the work is completed. In

how many days is the work completed ?

- a. 5
- b. 6
- c. 9
- d. 7

Ans: D

Explanation: Let the work be 60 units. If venky leave 3 days before the work, Last 3 days must be worked by Ravi. So the remaining days of work be x days, total days to complete the work be $x + 3$ days.

Now Capacities of Rajiv is $60/10 = 6$, Venky is 5, Ravi is 4.

$$(6 + 5 + 4) 2 + (5 + 4) (x - 3) + 4 \times 3 = 60.$$

$$30 + 9x - 27 + 12 = 60$$

$$9x - 15 = 30$$

$$9x = 45$$

$$x = 5$$

So total days to complete the work = $2 + 5 = 7$ days.

17. A man has a job, which requires him to work 8 straight days and rest on the ninth day. If he started work on Monday, find the day of the week on which he gets his 12th rest day.

- a. Thursday
- b. Wednesday
- c. Tuesday
- d. Friday

Ans: B

Explanation:

He works for 8 days and takes rest on the 9th day. So On the 12th rest day, there are $9 \times 12 = 108$ days passed. Number of odd days = $(108 - 1) / 7 = 107 / 7 = 2$. So the 12th rest day is wednesday.

18. On a 26 question test, five points were deducted for each wrong answer and eight points were added for each correct answer. If all the questions were answered, how many were correct, if the score was zero ?

- a. 10

b. 12

c. 11

d. 13

Ans: A

Explanation:

Take options and check. If 10 are correct, his score is $10 \times 8 = 80$. But 16 are wrong. So total negative marking is $16 \times 5 = 80$. So final score is zero.

TCS latest questions with solutions - 2015 (20)

1. problemsolvingproblemsolvingprob Find the 2015th term in the series?

Sol.

Problemsolving = 14 letter word. So divide 2015 by 14 and find the remainder. Here remainder is 13. so 13th letter in problemsolving is 'n'

2. 4 men can check exam papers in 8 days working 5 hours regularly. What is the total hours when 2 men will check the double of the papers in 20 days?

Sol.

Let a man can do 1 unit of work in 1 hour.

Total units of work = $4 \times 8 \times 5 = 160$ units.

Now work = $2 \times 160 = 320$ units.

Now 2 men work for 20 days. Let in x hours they have to work per day.

Now total work = $2 \times x \times 20 = 40x$

$40x = 320$ So $x = 320/40 = 8$ hours.

3. $X = 101102103104105106107.....146147148149150$ (From numbers 101-150). Find out the remainder when this number is divided by 9.

Sol:

The divisibility rule for 9 is sum of the digits is to be divisible by 9. So

We calculate separately, sum of the digits in hundreds place, tenths place, and units place.

Sum of the digits in hundreds place: $1 \times 50 = 50$

Sum of the digits in tenths place : $0 \times 9 + 1 \times 10 + 2 \times 10 + 3 \times 10 + 4 \times 10 + 5 \times 1 = 105$

Sum of the digits in units place : $(1 + 2 + 3 + \dots + 9) \times 5 = 225$

So total = 380

So remainder = $380 / 9 = 2$

4. A number is 101102103104...150. As 101 102 103 103.... 150. What is remainder when divided by 3?

Sol. Divisibility rule for 3 also same as 9. so from the above discussion sum of the digits = 380 and remainder = $380/3 = 2$.

5. In 4 years, Raj's father age twice as raj, Two years ago, Raj's mother's age twice as raj. If Raj is 32yrs old in eight yrs from now, what is the age of Raj's mother and father?

Sol. Raj present age = $32 - 8 = 24$.

After 4 years Raj's age is 28. and Raj's fathers age is $28 \times 2 = 56$, and his present age is 52.

Two years ago, Raj's age is 22. and his mother's age is $22 \times 2 = 44$. His mother's present age = 46

6. $7^1 + 7^2 + 7^3 + \dots + 7^{205}$. Find out how many numbers present which unit place contain 3?

Sol. Units digits of first 4 terms are 7, 9, 3, 1. and this pattern repeats. So for every 4 terms we get one term with 3 in its unit digit. So there are total of $205/4 = 51$ sets and each set contains one terms with 3 in its unit digit.

Ans is 51.

7. In paper A, one student got 18 out of 70 and in paper B he got 14 out of 30. In which paper he did fare well?

Sol. Find the percentages. Paper A = $18/70 \times 100 = 25.7$

Paper B = $14/30 \times 100 = 46.6$

8. Find the total no of divisors of 1728 (including 1 and 1728)

Sol. Direct formula from our lesson on factors. [Click Here](#).

The number of factors or divisors of a number $N = a^p \cdot b^q \cdot c^r \dots = (p+1) \cdot (q+1) \cdot (r+1) \dots$ where $a, b, c \dots$ prime numbers.

$$1728 = 2^6 \times 3^3$$

$$\text{So total number of divisors} = (6 + 1) \cdot (3 + 1) = 28$$

9. The sum of two numbers is 45. Sum of their quotient and reciprocal is 2.05, Find the product of the numbers.

Sol: Let a, b be the numbers.

$$a + b = 45$$

$$ab + ba = 2.05$$

$$\Rightarrow a^2 + b^2 = 2.05ab$$

$$\Rightarrow (a+b)^2 - 2ab = 2.05ab$$

$$\Rightarrow (a+b)^2 = 2.05ab + 2ab = 4.05ab$$

$$\Rightarrow ab = 45^2 / 4.05 = 500$$

10. A number is divided by 406 leaves remainder 115, What will be the remainder when it will be divided by 29?

Sol. Let the number be N .

$$\text{So } N = 406x + 115.$$

Now divide this number by 29. As 406 is exactly divisible by 29, we have to divide 115 by 29 and find the remainder. So remainder = 28

11. $(p/q - q/p) = 21/10$. Then find $4p/q + 4q/p$?

sol.

$$\text{Let } p/q = a, \text{ then } (a - 1/a) = 21/10$$

$$\Rightarrow a^2 - 1 = a \cdot 21/10$$

$$\Rightarrow 10a^2 - 21a - 10 = 0$$

$$\text{Roots of the equation} = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$a = \frac{21 \pm \sqrt{441 + 400}}{20} = \frac{21 \pm 29}{20}$$

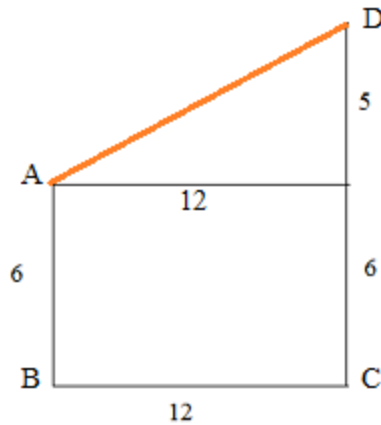
$$a = \frac{21 + 29}{20} = 5/2 \text{ or } -2/5$$

For $a = 5/2$, $4p/q + 4q/p = 58/5$

For $a = -2/5$, $4p/q + 4q/p = -58/5$

12. Two vertical ladders length of 6 m and 11 m are kept vertically at a distance of 12 m. Find the top distance of both ladders?

Sol:

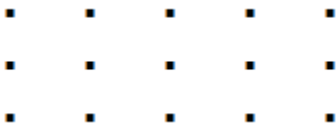


So distance between the top points = $AD = \sqrt{12^2 + 5^2} = 13$

So in paper B he did well.

Updated:

13.



Here is 15 dots. If you select 3 dots randomly, what is the probability that 3 dots make a triangle?

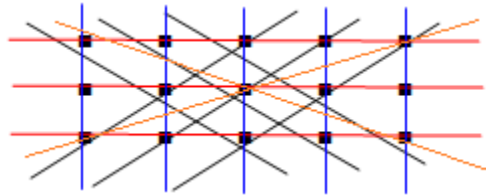
a. $440/455$

b. 434/455

c. 449/455

d. 438/455

Sol.



I think there seem some problem with this question. Total ways of selecting 3 dots out of 15 is ${}^{15}C_3 = 455$ If 3 dots are collinear then triangle may not be formed. Now look at the above diagram. If we select any 3 dots from the red lines they may not form a triangle. They are $3 \times {}^5C_3 = 30$. If we select the three letters from blue lines, they may not form a triangle. They are in total 5 ways. Also there are 6 others lines which don't form a triangle. Also another two orange lines. Total = $30 + 5 + 6 + 2 = 43$. So we can form a triangle in $455 - 43 = 412$. So answer could be 412/455.

14. In a series of numbers , the next number is formed by adding 1 to the sum of the previous numbers, and the 10th number is 1280. Then what is the first number in the series? (series will be like this $x, x+1, (x+(x+1))+1, \dots$)

a. 1

b. 4

c. 5

d. None of these

Answer: Option B

Sol.

The given series is $x, x + 1, 2x + 2, 4x + 4, \dots$

If you observe the pattern here, the coefficient of $x + 1$ is in the powers of 2. So 4th term has a power of 2, 5th term has a power of 3... 10th term has a power of 8. So tenth term would be $2^8(x + 1)$
 $= 256(x+1)$.

Given $256(x+1) = 1280$

$x = 4.$

15. The number of multiples of 10 which are less than 1000, which can be written as a sum of four consecutive integers is

a. 50

b. 100

c. 150

d. 216

Answer: Option A

Sol:

We can write $10 = 1 + 2 + 3 + 4$. So we have to find how many multiples of 10 can be written in this manner.

Let the first of the four numbers be n . So

$$n + (n+1) + (n+2) + (n+3) = 10k$$

$$4n + 6 = 10k$$

$$2n + 3 = 5k$$

$$n = 5k - 3 \quad 2 = 2k - 1 + k - 12$$

So n is integer for $k =$ an odd number. So for $k = 1, 3, 5, \dots, 99$ we can write a number as a sum of four consecutive integers.

So there are 50 numbers.

16. Mr. Bean chooses a number and he keeps on doubling the number followed by subtracting one from it, if he chooses 3 as initial number and he repeats the operation for 30 times then what is the final result?

a. $(2^{30}) - 1$

b. $(2^{30}) - 2$

c. $(2^{31}) - 1$

d. $(2^{31}) - 2$

Ans: No option

Sol:

Step 1: $(3 \times 2) - 1 = 5 (2^2 + 1)$

Step 2: $(5 \times 2) - 1 = 9 (2^3 + 1)$

Step 3: $(9 \times 2) - 1 = 17 (2^4 + 1)$

Step 4: $(17 \times 2) - 1 = 33 (2^5 + 1)$

So After 30 steps we have $2^{31} + 1$

17. Tony alone can paint a wall in 7 days and his friend Roy alone can paint the same wall in 9 days. In how many days they can paint the wall working together? Round off the answer to the nearest integer.

a. 3

b. 4

c. 5

d. 7

Answer: Option B

Sol. use formula $(xy / x+y)$

So nearest value for $3.93 = 4$

18. In this question, A^B means A raised to the power B. Let $f(X)=1+X+x^2+....x^6$. The remainder when $f(X^7)$ is divided by $f(X)$ is

a. 0

b. 6

c. 7

d. None of the other 3 choices.

Answer: C

Explanation:

Given that $f(x^7)=1+x^7+(x^7)^2 ++ (x^7)^6 = 1+x^7+x^{14}+....+x^{42}$

We will rewrite the above equation, $f(x^7)=1+(x^7-1)+(x^{14}-1)+\dots+(x^{42}-1)+6$

We know that $x^7-1=(x-1)(x^6+x^5+\dots+1)$

($\because x^n-a_n = (x-a).(x^{n-1}+x^{n-2}.a+x^{n-3}.a^2+\dots+a^{n-1})$)

Now It is clear that x^7-1 is exactly divisible by $f(x)$.

Also $x^{14}-1=(x^7)^2-1^2$ and x^7-1 is a factor of this expression. ($\because x^n-a_n$ is always divisible by $x-a$)

Similarly, we write $x^{21}-1=(x^7)^3-1^3$, $x^{28}-1=(x^7)^4-1^4\dots$

So remainder = $1 + 6 = 7$

(If you like the above solution, like our page and +1 it)

TCS latest pattern previous placement questions - 21

1. How many of the numbers x (x being integer) with $10 \leq x \leq 99$ are 18 more than the sum of their digits

- a. 9
- b. 12
- c. 18
- d. 10

Answer: d

Explanation:

Let the number be ab . So given that

$$\Rightarrow 10a + b = 18 + a + b$$

$$\Rightarrow 9a = 18$$

$$\Rightarrow a = 2$$

So 20, 21, ... upto 29 there are total 10 numbers possible.

2. Apples cost L rupees per kilogram for the first 30 kilograms and Q 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 kgs of apples is:

- a. Rs.117
- b. Rs.350
- c. Rs.281
- d. Rs.1053

Answer: b

Explanation:

Given that

$$30L + 3Q = 1167$$

$$30L + 6Q = 1284$$

Solving we get $Q = 39$, $L = 35$

So cost of first 10 kgs of apples = $35 \times 10 = 350$

3. A conical tent is to accommodate 10 persons. Each person must have 6 sq.meter space to sit and 30 cubic meter of air to breathe. What will be the height of the cone?

- a. 150m
- b. 37.5 m
- c. 15 m
- d. 75 m

Answer: c

Explanation:

Each person needs 6 sq meter of space. So

$$\Rightarrow \pi r^2 = 6 \times 10 = 60$$

$$\Rightarrow \pi r^2 = 60$$

Total volume of the tent = $30 \times 10 = 300$

$$\text{So } \frac{1}{3} \pi r^2 h = 300$$

$$\Rightarrow \frac{1}{3} \times 60 \times h = 300$$

$$\Rightarrow h = 15 \text{ m}$$

4. George and Mark can paint 720 boxes in 20 days, Mark and Harry in 24 days and Harry and George in 15 days. George works for 4 days, Mark for 8 days and Harry for 8 days. The total number of boxes painted by them is

a. 252

b. 516

c. 348

d. 492

Answer: c

Explanation:

Capacities of these people as follows

$$G + M = 720/20 = 36$$

$$M + H = 720/24 = 30$$

$$H + G = 720/15 = 48$$

$$\text{Adding all above we get } 2(G + M + H) = 114 \Rightarrow G + M + H = 114/2 = 57$$

Now individual capacities are given below

$$G = 27 ; M = 9 ; H = 21$$

$$\text{So } 27 \times 4 + 9 \times 8 + 21 \times 8 = 348$$

5. University of Vikramasila has enrolled nine PhD candidates. Babu, Chitra, Dheeraj, Eesha, Farooq, Gowri, Hameed, Iqbal, Jacob.

-Farooq and Iqbal were enrolled on the same day as each other, and no one else was enrolled that day.

-Chitra and Gowri were enrolled on the same day as each other, and no one else was enrolled that day.

-On each of the other days of hiring, exactly one candidate was enrolled.

-Eesha was enrolled before Babu.

-Hameed was enrolled before Dheeraj

-Dheeraj was enrolled after Iqbal but before Eesha

-Gowri was enrolled after both Jacob and Babu

-Babu was enrolled before Jacob

Who were the last two candidates to be enrolled?

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

Answer: d

Explanation:

Given that

- 1. Easha < Babu
- 2. Hameed < Dheeraj
- 3. Iqbal < Dheeraj < Easha
- 4. Jacob/Babu < Gowri
- 5. Babu < Jacob

from 1 and 5, Easha was before Babu and Jacob so she cannot be in the last two. Option B ruled out

from 4 and 5, babu is before Jacob and Gowri so he cannot be in the last two. Options a, c ruled out.

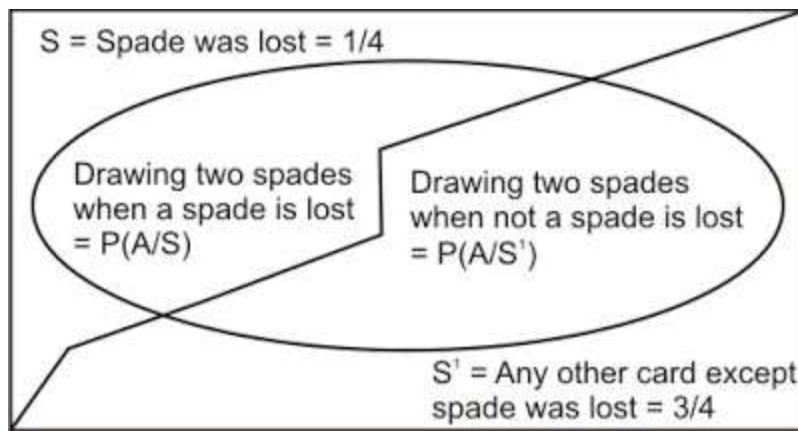
So option d is correct.

6. A card from a pack of 52 cards is lost. From the remaining cards of the pack, two cards are drawn and are found to be both spade. Find the probability of the lost card being a spade.

- a. 10/50
- b. 10/53
- c. 11/50
- d. 11/53

Answer:

Explanation:



Let S and S_1 be the respective events of choosing a spade and a card which is not spade. Let A denote drawing two spades. Out of 52 cards, 13 are spade and 39 cards are not spade.

$$P(S) = 13/52 = 1/4$$

$$P(S_1) = 39/52 = 3/4$$

We first calculate the total probability of drawing two spades when the missing card is a spade and the missing card is not a spade.

$$\text{Total probability} = P(A) = P(S \cap A) + P(S_1 \cap A) = P(S).P(AS) + P(S_1).P(AS_1)$$

When one spade is lost, there are 12 spades out of 51 cards. Two cards can be drawn out of 12 spade cards in ${}^{12}C_2$ ways. Similarly, 2 cards can be drawn out of 51 cards in ${}^{51}C_2$ ways.

$$\text{Probability of drawing 2 spades when one spade is lost} = \frac{{}^{12}C_2}{{}^{51}C_2} = \frac{22}{2425}$$

$$P(S \cap A) = P(S).P(AS) = \frac{1}{4} \times \frac{22}{2425}$$

When the lost card is not spade, there are 13 spades out of 51 cards. Two cards can be drawn out of 13 spades in ${}^{13}C_2$ ways whereas 2 cards can be drawn out of 51 cards in ${}^{51}C_2$ ways.

The probability of getting two cards, when one card is lost which is not spade, is given by $P(AS_1)$

$$P(AS_1) = \frac{{}^{13}C_2}{{}^{51}C_2} = \frac{26}{2425}$$

$$P(S_1 \cap A) = P(S_1).P(AS_1) = \frac{3}{4} \times \frac{26}{2425}$$

The probability that the lost card is spade given that two spades are drawn

$$= P(SA) = P(S \cap A)P(A) = P(S).P(A/S)P(S).P(A/S)+P(S_1).P(A/S_1) = 1/4 \times 22/425 + 3/4 \times 26/425$$

$$= 11/50$$

7. There are two bags containing white and black balls. In the first bag there are 8 white and 6 black balls and in the second bag, there are 4 white and 7 black balls. One ball is drawn at random from any of these two bags. Find the probability of this ball being black.

- a. 21/154
- b. 7/54
- c. 21/77
- d. 41/77

Answer:

Explanation:

$$\text{Probability} = 12 \times {}_6C_1 + 12 \times {}_7C_1 = 41/77$$

8. A bag contains 1100 tickets numbered 1, 2, 3, ... 1100. If a ticket is drawn out of it at random, what is the probability that the ticket drawn has the digit 2 appearing on it?

- a. 291/1100
- b. 292/1100
- c. 290/1100
- d. 301/1100

Answer: c

Explanation:

Numbers which don't have 2 from 1 to 9 = 8

Numbers which don't have 2 from 10 to 99:

Let us take two places ___. Now left most place is fixed in 8 ways. Units place is filled with 9 ways. Total 72 numbers.

$$\text{Numbers which don't have 2 from 100 to 999} = ___ = 8 \times 9 \times 9 = 648$$

Numbers which dont have 2 from 1000 to 1099 = $10 \times 9 = 81$

Finally 1100 does not have 2. So 1.

Total number with no 2 in them = $8 + 72 + 648 + 81 + 1 = 810$

Tickets with 2 in them = $1100 - 810 = 290$

Required probability = $290 / 1100$

9. 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

Answer: b

Explanation:

Maximum 3 men can be played which means there can be 0, 1, 2, 3 men in the team.

$$({}^5C_0 \times {}^{11}C_{11}) + ({}^5C_1 \times {}^{11}C_{10}) + ({}^5C_2 \times {}^{11}C_9) + ({}^5C_3 \times {}^{11}C_8) = 2256$$

TCS previous placement paper - 22

1. X takes 4 days to complete one-third of a job, Y takes 3 days to complete one-sixth of the same work and Z takes 5 days to complete half the job. If all of them work together for 3 days and X and Z quit, how long will it take for Y to complete the remaining work done.

a. 6 days

b. 7 days

c. 5.1 days

d. 8.1 days

Answer: c

Explanation:

X takes 12 days to complete the full work. Y takes 18 days, Z takes 10 days.

$$3 \text{ days work} = 3 \left(\frac{1}{12} + \frac{1}{18} + \frac{1}{10} \right) = \frac{43}{60}$$

Remaining work = $1 - \frac{4360}{1760} = \frac{1760}{1760}$

This work should be completed by Y in $\frac{1760}{18} = 9.78$ days

2. 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 take to paint the house if both them work together. (give answers to the nearest integer)?

- | | |
|------|------|
| a. 4 | b. 2 |
| c. 5 | d. 3 |

Answer: a

Explanation:

Simple formula = $\frac{xy}{x+y} = \frac{7 \times 9}{7+9} = 3.68 \approx 4$

3. 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 |

Answer: c

Explanation:

She got late to the office 20 minutes late as she drove at $\frac{3}{4}$ th of the speed.

Given, $\frac{3}{4}s - s = 20$

$\Rightarrow s(4-3) = 20$

$\Rightarrow \text{Time} = s = 20$

4. Curious Elva asked her father what he would gift for her nineteenth birthday. Father replied that it would depend on the day of the week and be one of SUNglasses, MONEybag, ..., FRIdcake, and SATchel. Please help Elva find the day of the week on 08-Jan-2029

- | | |
|-----------|------------|
| a. Monday | b. Tuesday |
|-----------|------------|

c. Thursday

d. Saturday

Answer: a

Explanation:

Number of odd days upto 2000 = 0

From 2001 to 2028 = $28 + 7 = 35 = 0$ ($\because 35/7$ remainder zero)

From 2019 January 1 to 7 = $7 = 0$

So 08 - Jan - 2029 falls on the same week day as 1-1-1 which is Monday.

5. All even numbers from 2 to 98 inclusive, except those ending 0, are multiplied together. What is the rightmost digit (the units digit) of the product?

a. 6

b. 2

c. 0

d. 4

Answer: a

Explanation:

$2 \times 4 \times 6 \times 8$ $\times 12 \times 14 \times \dots \times 98$

Now units digit of $2 \times 4 \times 6 \times 8 = 4$

Also $12 \times 14 \times 16 \times 18$ also 4. So on

Total 10 times 4 occurs in the units digit = $4_{10}=6$

6. In 2003, there are 28 days in February and there are 365 days in the year. In 2004, there are 29 days in February and there are 366 days in the year. If the date March 11, 2003 is Tuesday, then which one of the following would the date March 11, 2004 be?

a. Monday

b. Thursday

c. Wednesday

d. Tuesday

Answer: b

Explanation:

March 11, 2003 is Tuesday. So March 11, 2004 weekday will be 2 days after Tuesday. i.e., Thursday.

7. 8 year old Eesha visited her grandpa. He gave her this riddle.

I started working at 13. I spent $\frac{1}{6}$ of my working life in a factory. I spent $\frac{1}{4}$ of my working life in an office, and I spent $\frac{1}{4}$ of my working life as a school caretaker. For the last 32 years of my working life

I've been doing social service. How old am I?

a. 109

b. 102

c. 105

d. 113

Answer: a

Explanation:

Let x be the number of years he worked.

$$\Rightarrow x/6 + x/4 + x/4 + 32 = x$$

$$\Rightarrow x = 96$$

$$\text{His age} = 96 + 13 = 109$$

8. 100 students appeared for two examinations. 60 passed the first, 50 passed the second and 30 passed

both. Find the probability that a student selected at random has failed in both the examinations?

a. $\frac{1}{5}$

b. $\frac{5}{6}$

c. $\frac{1}{7}$

d. $\frac{5}{7}$

Answer: a

Explanation:

$$n(A \cup B) = n(A) + n(B) - n(A \cap B)$$

$$n(A \cup B) = 60 + 50 - 30 = 80$$

So 80 passed in atleast one of the exams. $100 - 80 = 20$ failed in both.

$$\text{Probability} = \frac{20}{100} = \frac{1}{5}$$

9. What is the greatest power of 143 which can divide $125!$ exactly

a. 12

b. 11

c. 8

d. 9

Answer: d

Explanation:

$143 = 11 \times 13$. So highest power of 13 should be considered in $125!$.

$$\begin{array}{r} 11 \overline{) 125} \\ \underline{11} \\ 1 \end{array} \quad \left. \vphantom{\begin{array}{r} 11 \overline{) 125} \\ \underline{11} \\ 1 \end{array}} \right\} 12 \qquad \begin{array}{r} 13 \overline{) 125} \\ \underline{9} \end{array}$$

Highest power of 11 in $125!$ is 12 but highest power of 13 is only 9. That means, $125! = 11^{12} \times 13^9 \times \dots$

So only nine 13's are available. So we can form only nine 143's in $125!$. So maximum power of 143 is 9.

10. Three containers A, B and C are having mixtures of milk and water in the ratio of 1:5, 3:5, 5:7 respectively. If the capacities of the containers are in the ratio 5:4:5, find the ratio of milk to water, if all the three containers are mixed together.

a. 53:115

b. 53:113

c. 54:115

d. 54:113

Answer: a

Explanation:

Weighted average rule can be applied = $5 \times 16 + 4 \times 38 + 5 \times 5125 + 4 + 5 = 53168$

So milk and water concentration = $53 : (168 - 53) = 53 : 115$

TCS-23

1. Overfishing is a serious environmental issue. It has been determined by the scientists that if the net of a trawler has mesh size x cm (a square mesh), then the percentage of fish entering the net that are caught in the net is $(100 - 0.04x^2 - 0.24x)$. For example, if the mesh size is zero, 100% of the fish that enter the net will be caught.

A trawler with net with a square mesh, that was suspect of using an illegal size net, dropped its net to the ocean floor near the Andamans and the coast guard, officials arrested the crew. The scientists later

looked the size of the fish caught, and estimated that for the net used by the trawler, atleast 97.8% of the fish entering the net would be caught. What is the maximum value of x for the net used by the trawler?

- a. 5
- b. 4.5
- c. 7
- d. None of the above answer

Answer: a

Explanation:

For some x, 97.8% fish was caught. So

$$\Rightarrow 100 - 0.04x^2 - 0.24x = 97.8$$

$$\Rightarrow 0.04x^2 + 0.24x = 2.2$$

$$\Rightarrow 4x^2 + 24x = 220$$

$$\Rightarrow x^2 + 6x - 55 = 0$$

Solving we get $x = 5$ and -11

So $x = 5$ is correct option.

2. Oranges can be packed in sets of 10 oranges in box type A or 25 oranges in box type B. A carton comprising of 1000 oranges of type a and b is packed. How many different combinations are possible in the number of type A and type B boxes while organizing the oranges?

- a. 21
- b. 20
- c. 19
- d. 18

Answer: a

Explanation:

$$\text{Given that } 10a + 25b = 1000 \Rightarrow 2a + 5b = 200$$

One general solution for the above equation is when $a = 0$, then $b = 40$.

To get other solutions, a is increased by 5 and b is decreased by 2. So next solution is (5, 38)

Now b is reduced upto 0.

$$\text{So total solutions} = 40 - 0 + 1 = 21$$



Solving equations in integers is an interesting branch of mathematics. These equations are called diophantine equations. [Click here](#) to read the article on this topic)

3. In a potato race, 20 potatoes are placed in a line of intervals of 4 meters with the first potato 24 meters from the starting point. A contestant is required to bring the potatoes back to the starting place one at a time. How far would he run in bringing back all the potatoes?

- a. 2400
- b. 1440
- c. 2480
- d. 1240

Answer: c

Explanation:

Given, total number of potatoes = 20.

First potato 24 metres from the starting point. There are 4 meters in the intervals. A contestant is required to bring the potatoes back to the starting place one at a time. So for the first potato he has to travel 48 meters, for second 56 meters ...

48,56,64.....20 terms.

$a = 48, d = 8, n = 20.$

Sum of n terms in A.P = $S_n = \frac{n}{2}[2a + (n-1)d]$

$S_{20} = \frac{20}{2}[2 \times 48 + (20-1)8]$

$S_{20} = 10[96 + 152]$

$S_{20} = 10 \times 248 = 2480$

\therefore 2480 meters he run in bringing back all the potatoes.

4. In this question A^B means A raised to the power of B Start with the integers from 1 to 10^{2012} . Replace each of them by the sum of its digits to get a string of 10^{2012} numbers. Keep doing this until you get 10^{2012} single digit numbers. Let m be the number of 1's and n be the number of 2's. Then $m - n$

a. 1

b. 3

c. 2

d. 0

Answer: a

Explanation:

We divide all the numbers into groups of 9. (1 to 9), (10 to 18).....

Now when we divide each term in the first group by 9, we get 1, 2, 3 ..0 as remainders. Now digit sum is nothing but finding remainder when a number is divided by 9. So the last term, 10^{2012} gives remainder 1 when divided by 9. So there is one "1" extra than 2's.

5. On a certain assembly line, the rejection rate for Hyundai i10s production was 4 percent, for Hyundai i20s production 8 percent and for the 2 cars combined 7 percent. What was the ratio of Hyundais i10 production?

a. 3/1

b. 2/1

c. 1/1

d. 1/2

Answer: a

Explanation:

Simple weighted average rule can be applied. Let a cars of i10's and b cars of i20s are made.

$$4(a) + 8(b) \quad a + b = 7$$

$$4(a) + 8(b) = 7a + 7b$$

$$3a = b \Rightarrow a/b = 3/1$$

6. Two decks of cards are there. Each deck contains 20 cards, with numbers from 1 to 20 written on them. A card is drawn of random from each deck, getting the numbers x and y What is the probability that $\log x + \log y$ is a positive integer. Logs are taken to the base 10.

a. 3/200

b. 29/200

c. $7/400$

d. $1/50$

Answer: c

Explanation:

$$\log x + \log y = \log(xy)$$

$\log xy$ is integer when $(x,y) = (1, 10), (10, 1), (10, 10), (5, 20), (20, 5), (2, 5), (5, 2)$

So required probability = $7/400$

7. Let a, b, c, d and e be distinct integers in ascending order such that

$(76-a)(76-b)(76-c)(76-d)(76-e) = 1127$. What is $a + b + c + d$

a. 30

b. 274

c. 334

d. 136

Answer: b

Explanation:

(Personally I liked the beauty of this question)

Product of 5 terms equal to 1127. As all the five terms are integers, given product should be a product of 5 numbers. Now factorize 1127.

$$1127 = 7^2 \times 23 = 7 \times 7 \times 23$$

But given that all the a, b, c, d, e are distinct. And we are getting only 3 terms with 7 repeats.

Now the logic is, integers means positive and negative, 7 and - 7 possible and 1, - 1 also possible . As

a,b, c, d, e are in ascending order, the factors should be in decreasing order. So (23, 7, 1, -1, -7)

Now $a = 53$; $b = 69$; $c = 75$; $d = 77$

$$a + b + c + d = 274.$$

8. 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

Answer: b

Explanation:

Maximum 3 men can be played which means there can be 0, 1, 2, 3 men in the team.

$$({}^5C_0 \times {}^{11}C_{11}) + ({}^5C_1 \times {}^{11}C_{10}) + ({}^5C_2 \times {}^{11}C_9) + ({}^5C_3 \times {}^{11}C_8) = 2256$$

9. In this question, A^B refers to A raised to the power B.

Ten tickets numbered 1, 2, 3, ..., 10. Six tickets are selected at random one of a time with replacement. The probability of the largest number appearing on the selected ticket is 7 is

a. $(7^6 + 1)/10^6$

b. $(7^6 - 6^6)/10^6$

c. $(7^6 + 6^6)/10^6$

d. $6^6/10^6$

Answer:

Explanation:

Number of ways of selecting six numbers out of 10 = 10^6

Now number of ways of selecting 6 numbers from 1 to 7 = 7^6

Number of ways of selecting 6 numbers from 1 to 6 = 6^6

So number of ways of selecting 7 numbers of which 7 is maximum = $7^6 - 6^6$

Required probability = $(7^6 - 6^6) / 10^6$

10. In the above table, the sum of numbers in each column, each row and the two diagonals are the same. What is the value of $(A*B) + (c*d) - (E*F)$?

93	E	119	99
A	103	C	109
107	111	F	101
117	B	95	D

Explanation:

We have to form equations.

$$311 + E = x \quad (1)$$

$$212 + A + C = x \quad (2)$$

$$319 + F = x \quad (3)$$

$$212 + B + D = x \quad (4)$$

$$317 + A = x \quad (5)$$

$$214 + E + B = x \quad (6)$$

$$214 + C + F = x \quad (7)$$

$$309 + D = x \quad (8)$$

$$196 + F + D = x \quad (9)$$

$$327 + C = x \quad (10)$$

Here 7 variables but 10 equations. So can be solved easily.

From (2) and (10)

$$212 + A + C = 327 + C \Rightarrow A = 115$$

$$\text{From (5), } x = 317 + 115 = 432$$

$$\text{From (1), } E = 432 - 311 = 121$$

$$\text{From (3), } F = 432 - 319 = 113$$

$$\text{From (8), } D = 432 - 309 = 123$$

$$\text{From (4), } B = 432 - 123 - 212 = 97$$

$$\text{From (10), } C = 432 - 327 = 105$$

93	E = 121	119	99
A = 115	103	C = 105	109
107	111	F = 113	101
117	B = 97	95	D = 123

$$\text{So } (A*B) + (C*D) - (E*F) = (115*97) + (105*123) - (121*113) = 10397$$

11. In the medieval times, the sheikdom of Al kurazi had a proud tradition of inventing their own measurements

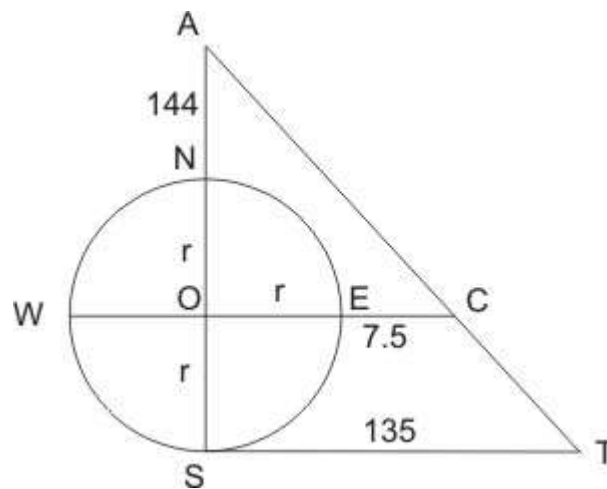
units. The unit for distance was du, and the unit of time was pu. Unfortunately exactly what these measurement units are in modern terminology has been lost.

The sheikh of Al Kurazi had built a huge mansion in the desert (near an oasis) with a circular wall around it, and the wall had four gates pointing north, south, east and west. He had built three observation towers, one 144 du to the north of the north gate, one 135 du to the east of the south gate, and one 7 1/2 du to the east of the east gate. They had been aligned to be all in a straight line passing thru the oasis. What was the diameter of the wall that surrounded the city (in Du)?

- a. 178
- b. 183
- c. 180
- d. 181

Answer: c

Explanation:



All the three gates are represented by A, C, and T. Now A is 144 du away from N and C is 7.5 du away from E and T is 135 du away from S, and all are in straight line.

$\triangle AOC, \triangle AST$ are similar triangles. So

$$\Rightarrow AOOC = ASST$$

$$\Rightarrow 144 + rr + 7.5 = 144 + 2r135$$

Solving we get $r = 90$. So diameter of the wall = 180 du

12. What is the minimum value of $\text{abs}(187m - 396n - 526)$ as m, n take all integer values? Here abs is the absolute value function (that is, if $x > 0$, then $\text{abs}(x) = x$ and if $x < 0$, then $\text{abs}(x) = -x$).

a. 0

b. 9

c. 2

d. 1

Answer: c

Explanation:

We have to find the minimum value of $|(187m - 396n - 526)| = |(187m - 396n) - 526|$

If $|(187m - 396n)|$ is 526 then the given expression attains minimum.

Now observe carefully, both 187, 386 are multiples of 11. So $|11(17m - 36n)|$ may not equal to exactly 526 but some value near to 526. Nearest multiple of 11 is 528.

Now $|11(17m - 36n)| = 528$

$$\Rightarrow (17m - 36n) = 48$$

$$\Rightarrow m = 48 + 36n17$$

$$\Rightarrow m = 2 + 2n + 14 + 2n17$$

So for $n = 10$, we get $m = 24$.

So $|11(17m - 36n)| = 528$ So minimum value of the given expression is 2.

3. In this problem, $\text{ABS}(x)$ provides absolute value of x , without regard to its sign. For example $\text{ABS}(3) = \text{ABS}(-3) = 3$

The graphs of $y = -\text{ABS}(x - a) + b$ and $y = -\text{ABS}(x - c) + d$ intersect at points (2,5) and (8, 3).

Find $a + c$

a. 8

b. 10

c. 7

d. 5

Answer: a

Explanation:

Both curves intersect at (2, 5)

$$\text{So } 5 = -|2 - a| + b \Rightarrow 5 + |2 - a| - b = 0 \dots (1)$$

$$5 = -|2 - c| + d \Rightarrow 5 + |2 - c| - d = 0 \dots (2)$$

Also,

$$3 = -|8 - a| + b \Rightarrow 3 + |8 - a| - b = 0 \dots (3)$$

$$3 = -|8 - c| + d \Rightarrow 3 + |8 - c| - d = 0 \dots (4)$$

$$\text{Equating 1 and 3, } 5 + |2 - a| = 3 + |8 - a| \Rightarrow 2 + |2 - a| = |8 - a|$$

$$\text{So } a = 4$$

Similarly if we equate 2 and 4, we get $c = 4$

$$a + c = 8$$

14. Professor nitwit obtains a hash number of a given positive integer > 3 as follows. He subtracts 2 from the number (to get the 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 1. The hash is defined as the sum of all the numbers generated in the process.

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 become 1, he stops. The hash is the sum of the two numbers $(6+2) = 8$.

If Professor Nitwit is given 3 numbers 19, 7, 15, what is the sum of the hash numbers he obtains for the three numbers?

a. 297

b. 273

c. 290

d. 278

Answer: d

Explanation:

As we are subtracting 2 continuously from the resulting numbers, get a progression with a common difference of 2 and we need to multiply the sum by 2 to get hash number.

For example 5: $(3 + 1) \times 2 = 8$

19 : $(17 + 15 + 13 + \dots + 1) \times 2 = 81 \times 2 = 162$

7 : $(5 + 3 + 1) \times 2 = 18$

15: $(13 + 11 + 9 + 7 + 5 + 3 + 1) \times 2 = 98$

Sum of the hash numbers = 278

15. Four people each roll a fair dice once. Find the probability that at least two people will roll the same number?

a. None

b. 5/18

c. 13/18

d. 1295/1296

Answer:

Explanation:

The probability of atleast two persons roll the same number = $1 - \text{None of them rolls the same number.}$

$= 1 - [6 \times 5 \times 4 \times 3] = 1 - 518 = 1318$

TCS latest pattern questions - 24

1. How many 6 digit even numbers can be formed from digits 1, 2, 3, 4, 5, 6, and 7 so that the digit should

not repeat and the second last digit is even?

a. 6480

b. 320

c. 2160

d. 720

Answer: d

Explanation:

If the we have to form even numbers, units digit must be 2, 4, 6. i.e., 3 ways. Also 5th digit should be even. So it can be filled in 2 ways. Now remaining 5 digits can be filled in 5! ways. So total $5! \times 3 \times 2 = 720$ ways.

2. The five tyres of a car (four road tyres and one spare) were used equally in a journey of 40,000

kms. The number of kms of use of each tyre was

a. 40000

b. 10000

c. 32000

d. 8000

Answer: c

Explanation:

Total kilometers travelled by 4 tyre = $40000 \times 4 = 1,60,000$. This has to be share by 5 tyres. So each tyre capacity = $1,60,000 / 5 = 32,000$. You have a doubt, after we travel 32,000 km, we are left with 4 worn tyres and one new tyre. But If the tyres are rotated properly after each 8000 km, all the tyres are equally used.

3. In a group of five families, every family is expected to have a certain number of children, such that the number of children forms an arithmetic progression with a common difference of one, starting with two children in the first family. Despite the objection of their parents, every child in a family has as many pets to look after as the number of offsprings in the family. What is the total number of pets in the entire group of five families.

a. 99

b. 9

c. 55

d. 90

Answer: d

Explanation:

As the number of children are in arithmetic progression starting with 2, the five families have 2, 3, 4, 5, 6 kids respectively. As each children has kept the pets equal to the number of kids in the family, each family has n^2 pets. So total = $2^2 + 3^2 + 4^2 + 5^2 + 6^2 = 90$

4. According to the stock policy of a company, each employee in the technical division is given 15 shares of the company and each employee in the recruitment division is given 10 shares. Employees belonging to both committees get 25 shares each. There are 20 employees in the company, and each one belongs to at least one division. The cost of each share is \$10. If the technical division has 15 employees and the recruitment division has 10 employees, then what is the total cost of the shares given by the company?

a. 2650

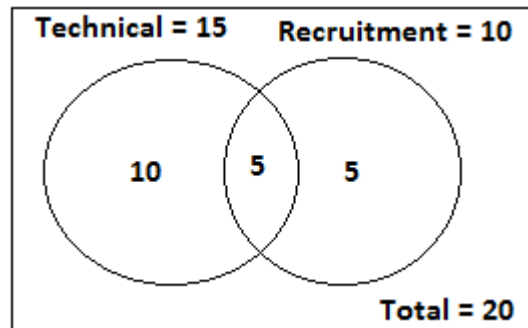
b. 3180

c. 3250

d. 3120

Answer: c

Explanation:



We have to use addition formula $n(A \cup B) = n(A) + n(B) - n(A \cap B)$

$$20 = 15 + 10 - x$$

$$x = 5$$

So total shares given to only technical = $10 \times 15 = 150$

Shares given to only Recruitment = $5 \times 10 = 50$

Share given to Technical as well as recruitment people = $5 \times 25 = 125$

Now two 3's has to be distributed to three numbers in ${}^{2+3-1}C_{3-1} = {}^4C_2 = 6$ ways

Now two 5's has to be distributed to three numbers in ${}^{2+3-1}C_{3-1} = {}^4C_2 = 6$ ways

Total ways = $15 \times 6 \times 6 = 540$

7. There is a 7-digit telephone number with all different digits. If the digit at extreme right and extreme left are 5 and 6 respectively, find how many such telephone numbers are possible?

- a. 120
- b. 30240
- c. None of these
- d. 6720

Answer: d

Explanation:

If left and right digits are fixed with 5 and 6, then the remaining 5 places can be filled by remaining 8 digits in ${}^8P_5 = 6720$ ways.

8. A certain sum of money is sufficient to pay either George's wages for 15 days or Mark's wages for 10 days. For how long will it suffice if both George and Mark work together?

- a. 8
- b. 6
- c. 9
- d. 5

Answer: b

Explanation:

Let the money to be paid = 30 rupees. Then George daily wage = $30/15 = 2$, and Mark daily wage = $30/10 = 3$.

If both are working, then 5 rupees to be paid. So given sum is sufficient for $30 / 5 = 6$ days.

9. The remainder when $m + n$ is divided by 12 is 8, and the remainder when $m - n$ is divided by 12 is 6. If $m > n$, then what is the remainder when mn divided by 6?

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

Answer: b

Explanation:

$$m + n = 12a + 8 \Rightarrow (m+n)^2 = 144a^2 + 192a + 64 \dots (1)$$

$$m - n = 12b + 6 \Rightarrow (m-n)^2 = 144b^2 + 144b + 36 \dots (2)$$

$$(1) - (2) \Rightarrow 4mn = 144a^2 + 192a - 144b^2 - 144b + 28$$

$$mn = 36a^2 + 48a - 36b^2 - 36b + 7$$

Now mn is divided by 6, all the terms except 7 gives 0. So 7 divided by 6, remainder = 1

10. There is a set of 36 distinct points on a plane with the following characteristics:

* There is a subset A consisting of fourteen collinear points.

* Any subset of three or more collinear points from the 36 are a subset of A.

How many distinct triangles with positive area can be formed with each of its vertices being one of the 36

points? (Two triangles are said to be distinct if at least one of the vertices is different)

a. 7140

b. 4774

c. 1540

d. 6776

Answer: d

Explanation:

The given data indicates that 14 points are collinear and remaining 22 points are non collinear.

A triangle can be formed by taking 1 points from 14 and 2 points from 22 (or) 2 points from 14 and 1

points from 22 (or) 3 points from 22

$$\Rightarrow {}^{14}C_1 \times {}^{22}C_2 + {}^{14}C_2 \times {}^{22}C_1 + {}^{22}C_3 = 6776$$