TCS Placement Questions Paper SET 1

1) 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?

Ans: Assume tank capacity is 45 Liters. Given that the first pipe fills the tank in 9 hours. So its capacity is 45 / 9 = 5 Liters/ Hour. Second pipe fills the tank in 5 hours. So its capacity is 45 / 5 = 9 Liters/Hour. If both pipes are opened together, then combined capacity is 14 liters/hour. To fill a tank of capacity 45 liters, Both pipes takes 45 / 14 = 3.21 Hours.

2) If 75 % of a class answered the first question on a certain test correctly, 55 percent answered the second question on the test correctly, and 20 percent answered neither of the questions correctly, what percentage answered both correctly?

It is a problem belongs to sets. We use the following formula n(A
∪
∪
B) = n(A) + n(B) - n(A
∩
∩
B)

Here n(A
∪
∪
B) is the people who answered atleast one of the questions.

It was given that 20% answered neither question then the students who answered atleast one question is 100% - 20% = 80%

Now substituting in the formula we get 80% = 75% + 55% - n(A
∩
∩
B)
⇒
⇒
n(A
∩
∩
B) = 50%

3) A student's average (arithmetic mean) test score on 4 tests is 78. What must be the students score on a 5th test for the students average score on the 5th test to be 80?

Ans: We know that Average
=

Sum of the observations
No of observations
=Sum of the observations No of observations

So Sum of 4 test scores = 78
×
×
4=312
Sum of 5 tests scores = 80
×
×
5=400
⇒
⇒
5th test score=400-312=88

Alternative method: If the student scores 78 in the fifth test also, what could be his average? No change. Is it not?
But to bring the average to 80, he must have scored enough marks extra so that each of the five subject scores increase upto 80. i.e., he should have scored 2 x 5 = 10 runs extra in the fifth subject.
So 5th subject score is 78 + 10 = 88

4) 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.
Ans: If average rural household includes more people, then how come they have more purchasing power? Infact, they have less purchasing power as they have to feed more people. Option A ruled out.
Option C does not explain why rural households have more purchasing power than urban. Ruled out.
If median income of urban and suburban households is generally higher than rural households they are likely to have more purchasing power, assuming other parameters constant. But this does not explain why rural households have more purchasing power. Options D ruled out.

Option E does not provide any explanation why rural households have more purchasing power. Ruled out.
Option B is correct as, If rural households spend less income on food and shelter due to less prices they definitely have more disposable income to spend.

5) 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?
Ans: Total seeds germinated in Plot I = 57% of 200 = 114
Total seeds germinated in Plot II = 42% of 300 = 126
Total germinated seeds = 114 + 126 = 240
The percentage of germinated seeds of the total seeds =
240
500
×
100
240500×100
= 48%

6) A closed cylindrical tank contains 36
π
π
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?
Ans: We know that the volume of cylinder =
π
r
2
h
πr2h

Given tank hight = 4ft.
⇒
⇒

π
r
2
4
πr24
= 36
π

π

⇒

⇒

r = 3

So the radius is 3 which means the diameter is 6.

As the cylinder is filled to initially exactly half of the capacity, When this cylinder is placed on its side, Water comes upto the height of the radius.

So water comes upto 3 ft.

7) 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?

Assume the present students and teachers are 30K, K

After new recruitments of students and teachers the strength becomes 30K + 50, K + 5 respectively.

But given that this ratio = 25 : 1

⇒

30

K

+

50

K

+

5

=

25

1

⇒30K+50K+5=251

Solving we get K = 15

So present teachers are 15.

8) 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

If we assume exactly 30 students are not majoring in any subject then the students who take atleast one subject = 200 - 30 = 170

We know that n(A

∪

∪

B) = n(A) + n(B) - n(A

∩

∩

B)

⇒

⇒

170 = 130 + 150 - n(A

∩

∩

B)

Solving we get n(A

∩

∩

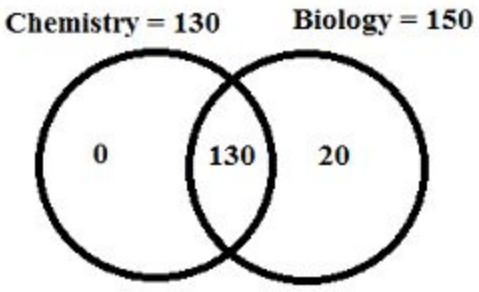
B) = 110.

i.e., Students who can take both subjects are 110

But If more than 30 students are not taking any subject, what can be the maximum number of students who can take both the subjects?

As there are 130 students are majoring in chemistry, assume these students are taking biology also.

So maximum students who can take both the subjects is 130



So the number of students who can take both subjects can be any number from 110 to 130.

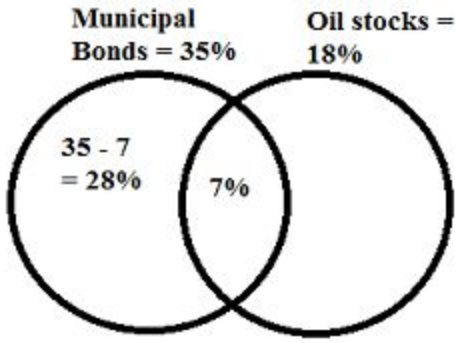
9) Kelly and Chris are moving into a new city. Both of them love books and thus packed several boxes with books. If Chris packed 60% of the total number of boxes, what was the ratio of the number of boxes Kelly packed to the number of boxes Chris packed?

Simple questions. If chris packs 60% of the boxes, kelly packs remaining 40%

So Kelly : Chris = 40% : 60% = 2 : 3

10) Among a group of 2500 people, 35 percent invest in municipal bonds, 18 percent invest in oil stocks, and 7 percent invest in both municipal bonds and oil stocks. If 1 person is to be randomly selected from 2500 people, what is the probability that the person selected will be one who invests in municipal bonds but not in oil stocks?

Ans: Here 2500 is redundant



From the diagram we know that only ones who invested in municipal bonds are 28%, the probability is 28 / 100 = 7/25

11) 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?

Ans: Machine A produces 120/40 = 3 bolts in 1 second and machine B produces 100/20 = 5 bolts in one second.

Hence, both of them will produce 8 bolts per second.

Hence, they wil take 200/8 = 25 seconds to produce 200 bolts.

12) How many prime numbers between 1 and 100 are factors of 7150?

Ans: 7, 150 =

2

×

5

2

×

11

×

13

2×52×11×13

So there are 4 distinct prime numbers that are below 100

13) Analyzing 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?

This is a question on compound interest to be calculated semi annually.
In the case of semi annual compounding, Interest rate becomes half and Number of periods becomes 2 per year.
So A = P
(
1
+
R
100
)
n
(1+R100)n

⇒
A
=
10
,
000
(
1
+
4
100
)
2
=
10
,
000
×
26
25
⇒A=10,000(1+4100)2=10,000×2625

= 10,816
Interest = A - P = 10, 816 - 10,000 = 816

14) Juan is a gold medalist in athletics. In the month of May, if Juan takes 11 seconds to run y yards, how many seconds will it take him to run x yards at the same rate?
Ans: If juan takes 11 seconds to run Y yards, for 1 yard he will take 11 / y seconds. To run x yards his time will be 11 / y

×
×
x = 11x/ y

15) 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?https://www.freshersnow.com/placement-papers-download/
Assume it has taken x years to the female employee to reach the rule of 70.
So her age should be 32 + x. Also she gains x years of experience.
⇒
⇒
(32 + x) + x = 70
⇒
⇒
x = 19.
Her age at the time of retirement = 1986 + 19 = 2005

16) Of the following, which is the closest approximation of (50.2*0.49)/199.8 ?
ans: For approximation (50.2
×
×
0.49)/199.8 can be taken as
50
×
×
0.5/200 = 25/200 = 1/8 = 0.125

17) Andalusia has been promoting the importance of health maintenance. From January 1,1991 to January 1,1993, the number of people enrolled in health maintenance organizations increased by 15 percent. The enrollment on January 1,1993 was 45 million. How many million people(to the nearest million) was enrolled in health maintenance organizations on January 1,1991?
Ans: If a number K is to be increased by x % it should be multiplied by
(
100
+
x
)
100
(100+x)100

So When the enrollment in January 1, 1991 is multiplied by
(

100
+
x
)
100
(100+x)100
we got 45 million.
K
×
(
100
+
15
)
100
=
45
K×(100+15)100=45

K =
45
×
100
115
45×100115
= 39.13

18) What is the lowest possible integer that is divisible by each of the integers 1 through 7, inclusive?
Ans: If a number has to be divisible by each number from 1 to 7, that number should be L.C.M of(1,2,3,4,5,6,7) = 420

19) If the area of a square region having sides of length 6 cms is equal to the area of a rectangular region having width 2.5 cms, then the length of the rectangle, in cms, is
Ans: Given Area of the square = Area of rectangle
⇒
a
2
=
l
.
b

⇒a2=l.b

Substituting the above values in the formula
⇒
6
2
=
l
.2
.5
⇒62=l.2.5

⇒
⇒
l = 14.4 cm

20) A tank contains 10,000 gallons of a solution that is 5 percent sodium chloride by volume. If 2500 gallons of water evaporate from the tank, the remaining solution will be approximately what percentage of sodium chloride?
Ans: Sodium chloride in the original solution = 5% of 10,000 = 500
Water in the original solution = 10,000 - 500 = 9,500
If 2,500 Liters of the water is evaporated then the remaining water = 9,500 - 2,500 = 7,000
Sodium chloride concentration =
500
500
+
7000
×
100
500500+7000×100
= 6.67 %
(concentration should be calculated always on the total volume)

21) After loading a dock, each worker on the night crew loaded 3/4 as many boxes as each worker on the day of the crew. If the night crew has 4/5 as many workers as the day crew, what fraction of all the boxes loaded by two crews did the day crew load?
Assume the number of boxes loaded in dayshift is equal to 4, then the number of boxed loaded in night shift = 3
Assume the worked on dayshift = 5, then workers on night shift = 4

	Day shift	Night shift
Boxes	4	3
Crew size	5	4
Total Loaded	20	12

So boxes loaded in day shift = 4 x 5 = 20, and boxes loaded in night shift = 3 x 4 = 12
so fraction of boxes loaded in day shift =
20
20
+
12
=
5
8
2020+12=58

22) 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?
Ans: If half of the rolls were sold by noon, the remaining are 50 % (40) = 20.
Given 80% of the remaining were sold after the noon to closing time
⇒
⇒
80% (20) = 16
Unsold = 20 - 16 = 4

23) If N=4P, where P is a prime number greater than 2, how many different positive even divisors does n have including n?
Ans: N =
2
2
×
P
1
22×P1

We know that total factors of a number which is in the format of
a
P

×
b
Q
×
c
R
.
.
.
aP×bQ×cR...
= (P + 1). (Q + 1). (R + 1) .... = (2 + 1).(1 + 1) = 6
Also odd factors of any number can be calculated easily by not taking 2 and its powers.
So odd factors of
2
2
×
P
1
22×P1
= the factors of
P
1
P1
= (1 + 1) = 2
Even factors of the number = 6 - 2 = 4

24) 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?
Ans: Per battery cost = q / 100
If each battery is sold for 50% gain, then selling price =
C
o
s
t
P
r
i
c
e
×
(
100

+
G
a
i
n
100
)
CostPrice×(100+Gain100)

⇒
⇒

q
100
×
(
100
+
50
100
)
=
3
q
200
q100×(100+50100)=3q200

25) The price of lunch for 15 people was 207 pounds, including a 15 percent gratuity of service. What was the average price per person, EXCLUDING the gratuity?

Ans: Let the net price excluding the gratuity of service = x pounds

Then, total price including 15% gratuity of service =

x
×
(
100
+
15
100
)
x×(100+15100)
= 1.15 x pounds

So, 1.15 x = 207 pounds

⇒

⇒

x = 207 / 1.15 = 180 pounds

Net price of lunch for each person = 180 / 15 = 12 pounds