04.09.2020 SESSION CTS

ATTENDANCE LINK WILL EXPIRE AT 9:15 AM SHARP

1. A bag contains orange flavoured candies only. Malini takes out one candy without looking into the bag. What is the probability that she takes out an orange flavoured candy?

PROBABILITY = FAVOURABLE OUTCOMES FROM THE EVENT / TOTAL OUTCOMES FROM THE EVENT

Find the probability of getting a number greater than 4 in a throw of a die ?

Event = Throwing a die.

Total outcomes = { 1,2,3,4,5,6}

Favourable outcomes = {5,6}

P = 2 / 6 = 1 / 3.

Numerical value of Probability 0 < P < 1.

1. 0 – Impossible event. (Watever you do you cannot make it happen)

1 – Sure event.(Watever you do you cannot stop it from happening)

P = F / T = nC1 / nC1 = 1.

Event = Choosing a candy.

Total outcomes = nC1 🡪 no of orange candies

Favourable = nC1 🡪 No of orange candies

P = F / T = nC1 / nC1 = 1.

2. Sameer plants 7225 plants, so that there are as many rows as there are trees in a row. How many trees are there in a row?

There are as many rows as there are trees in a row.

Row 1 – tree 1 , tree 2 , tree 3

Row 2 – tree 4 , tree 5 , tree 6

Row 3 – tree 7, tree 8, tree 9.

No of Row \* No of Column = 3 \* 3 = 9

= x \* x = 7225

X = 85.

1-5 2-5 3-5 4-5 5-5 6-5 7-5 8-5 9-5 10-5 11-5 12-5

225 625 1225 2025 7225

3. What is the difference between the LCM and HCF of the numbers 20, 30, and 40?

Given numbers 20,30,40.

HCF = (15,25)

15 = 3 \* 5.

25 = 52 .

Least power of the common factor= 5.

HCF(15,25) = 5(3,5) 🡪5 is the HCF of 15,25.

HCF(3,5) = 1(3,5) 🡪1 is the HCF of 3,5🡪Co-prime Numbers.(5,7),(5,7,9),(5,7,9,13,17)

HCF (20,30,40) = 2 (10,15,20) =2\*5 (2,3,4) = 10 is HCF of 20,30,40

LCM (20,30,40) = LCM (20,30)= 60 = LCM (20,30,40) = 60 \* 2 =120

LCM (20,30,90) = LCM (20,30)= 60 = LCM (20,30,90)= 60\*3=180

1. Assume 30 is your LCM

2. Assume 30 \* 2 as your LCM

Answer is 120 – 10 = 110.

4. Ramesh, Abhijeet and Ajay are eligible to be the captain of the cricket team. Shaid, John, Shisir and Nitin are eligible to be the co-captain. How many possible outcomes are there for choosing a captain and a co-captain?

Ramesh , Abhijeet , Ajay 🡪 Eligible Captains

Shaid , John , Sirish , Nitin 🡪 Eligible Co Captains

How many ways can u select a captain and a co captain.

Captains – 3 ; Co Captains – 4

a captain and a co captain

3C1 \* 4C1 = 3 \* 4 = 12 ways

5. The number 2594' is completely divisible by 6. The smallest value of " can be:

a. 0 b. 2 c. 4 d. 6

2594\* is completely divisible by 6.What is the least value of \*

A no is div by 6, if it is div by 2 & 3.

0 2 4 6 8 🡪 Div 2

2 + 5 + 9 + 4 + \* = a multiple of 3

2 + 5 + 9 + 4 + 0 = 20 not div 3

2 + 5 + 9 + 4 + 2 = 22 not div 3

2 + 5 + 9 + 4 + 4 = 24 div 3

2 + 5 + 9 + 4 + 6 = 26 not div 3

2 + 5 + 9 + 4 + 8 = 28 not div 3

ANSWER - 4

6. (((1/8)-1)-4)-1

(am)n = amn.

a-n = (1 / a)n.

= (((1/8)-1)-4)-1

a= 1/8 ; m=-1; n = -4

((1/8)4)-1

a=1 / 8 ; m=4; n = -1

(1/8)-4 = 84 = 4096

7. The simple interest earned on a certain amount is double the money when invested for 15 years. What interest rate is offered?

SI = Double the Principal when invested for 15 years.

SI = (PNR) / 100 🡪 2P = (P15R) / 100 = 200 / 15 = 13.33%

SI 🡪 Simple Interest

P 🡪 Principal or Sum.

N 🡪 Time in yrs.

R 🡪 Rate Of Interest per annum

8.

The value of a smartphone depreciates(Decreases) at the rate 15 % pa.

What is its value at the end of 2 yrs if its original value was Rs 100.

100 decrease it by 30 % = 100 \* 70 / 100 = Rs .70

Jan 1 2021 – Rs.100 Dec 31 2021 – Rs 85

Jan 1 2022 - Rs 85 Dec 31 2022 – 85 \* 85 / 100= 72.25

A machine worth Rs. 1,80,000 depreciates at the rate of 18% of the value of the machine per annum. The value of the machine in 18 months from now will be:

Initial Worth of scooter = 1,80,000.

Rate of depreciation = 18 % pa. or 9 % for 6 mths

Worth or Value of scooter after 18 months = ?

For 1 year decrease % = 18 %

For 1 ½ years decrease % = 18 % + 9 % = 27 % for 1 ½ yrs

At the start of 1st year value of scooter = 1,80,000.

Reduce a no by R % = no \* (100-R) / 100

Increase a no by R % = no \* (100+R) / 100

At the end of 1 year value of scooter = 1,80,000 \* (100-18) / 100 🡪reducing by 18 %

= 1,47,600 (end of 12 mths)

At the start of 2nd year value of scooter = 1,47,600 \* (100-9) / 100 🡪reduce by 9%

= 1,34,316

9. The correct relationship after eliminating x, y and z from x + y = a, y + z=b, z + x = c and x + y + z = m, is:

a. m=x+y+z b. 2m=a +b+c c. m=x-y-z d. 2m =x-y-z e. None of the above

x + y=a ; x + z = c ; y + z = b.

x + y + z = m

2(x + y + z ) = a + b + c

2m= a + b + c.

10. root(9-(root(3 + root(5-root(3+root(169))))))

root(9-(root(3 + root(5-root(3+13)))))

root(9-(root(3 + root(5-root(16)))))

root(9-(root(3 + root(5-4))))

root(9-(root(3 + root(1))))

root(9-(root(3 +1)))

root(9-(root(4)))

root(9-2) = root 7

11. A water pump takes 6 hours to fill an over head tank. Standby pump takes 10 hours to fill the same over head tank. If first pump fails after 2 hours of running, then how long will the standby pump take to fill the overhead tank?

Water Pump takes 6 hrs to fill a tank

Standby Pump takes 10 hrs to fill the same tank

First 2hrs water pump works but it fails after that

2 hrs 🡪 Water Pump

After 2 hrs 🡪 Standby Pump

LCM METHOD:

LCM (6,10) = 30 units 🡪Total Work.

Eff water pump = 30 units / 6 hrs = 5 units / hr

Eff Standby pump = 30 units / 10 hrs = 3 units / hr

Work Done = Efficiency \* Time

Eff = Work Done / Time

Time = Work done / Eff.

210 chocolates = 70 chocolates / hr \* 3 hrs

1. Time.

2. Workdone.

3. Workdone/ hr 🡪 Efficiency.

For the first 2 hrs water pump works.

At the end of 2 hrs 10 units will be completed.

Remaining work = 30 – 10 = 20 units.

Time standby = 20 units / 3 units/hr = 20 / 3 hrs = 6 2/3 hrs =6 (2/3\*60)- 6 hrs 40 mins

12. Successive change formula

1 80 000 🡪18 % pa,after 18 months

18%(1yr) + 9%(6mths)

A + B + (AB / 100) =-18-9+(162/100)= -27+1.62 = -25.38 %

1 80 000 \* 74.62 / 100 = 1 34 316

Three successive discounts of 6%, 10%, 15% are equal to a single discount of

Successive 6%,10%,15%.

A + B + (AB / 100) =-6-10+.6 =-15.4 % A=-6 ; B = -10

A + B + (AB / 100) = -15.4-15+ (231/100)=-30.4+2.31 =-28.09%

I increase a number by 10 % and decrease by 20 % and again increase by 30 %,What is the net % change?

+10,-20,+30

A= +10 ; B = -20

10-20- (200/100) =-10-2 = -12 %

A = -12 ; B = +30

-12+30-(360/100) = 18 -3.6 = 14.4%

12. Pointing to a lady, the man said,"The son of her brother is the Brother of my wife" How is the lady related to the person?

+ male

-female

Lady- 🡪 Bro +

Nephew+ 🡪 Sis Man+

Lady’s nephew and the man’s bro-in-law

SIMPLE INTEREST

Sum or Principal = 1000 R% = 10%pa(10 % of Principal for 1 year)

SI interest is the same each year.

1ST YEAR = 1000 + 100 = 1100

2ND YEAR= 1100 + 100 = 1200

3RD YEAR=1200 + 100 = 1300

4TH YEAR = 1300 + 100 = 1400

COMPOUND INTEREST

Sum or Principal = 1000 R% = 10%pa(10 % of Amount for 1 year)

At 0 yrs = P = Amount

CI interest is the same each year.

1ST YEAR = 1000 + 100 = 1100

2ND YEAR= 1100 + 110 = 1210

3RD YEAR=1200 + 121 = 1331

4TH YEAR = 1300 + 133.1 =

13. A certain sum of money amounts to Rs. 2,500 in a span of 5 years and further to Ps. 3,000 in a span of 7 years at simple interest. The sum is:

P= x A =2500 in 5 yrs

A = 3000 in 7 yrs

Amount 7 yrs – Amount of 5 yrs = 3000 – 2500 =500 🡪 SI for 2 yrs = 250 as SI for 1 yr

7 yrs Interest is 250 \* 7 = 1750.

Amount for 7 yrs = 3000

SI for 7 yrs = 1750

P =3000 – 1750 = 1250

Amount = P + SI

14. What sum of money will accumulate to Rs. 5,300 at 8% simple interest in 9 months?

A= 5300 ; P = ? ; 8% 9 mths

A = P + (PNR / 100)

5300 = P ( 1+9\*8/1200)

P = 5000.

15. A chemical mixture requires 2 chemicals, A and B in the proportion 3:2. The mixture is to be prepared in a tank of capacity 50 litres. Pipe A can fill the tank with chemical A in 15 minutes and pipe B can fill the tank with chemical B in 30 minutes. If both the pipes are opened when the tank is empty, then for how long should the pipes A and B run to obtain the mixture? (In minutes)

50 l tank capacity =chem A and chem B = 3 : 2

50 l tank must be filled with the mixture with Chem A & Chem B in ratio 3 : 2

Chem A 30 l

Chem B 20 l

Time taken by Pipe A to fill 50 l is 15 mins

Time taken by Pipe B to fill 50 l is 30 mins

Pipe A(Chem A) in 15 mins it will fill 50 l

? mins it will fill 30 l 🡪 9 mins

Pipe B(Chem B) in 30 mins it will fill 50 l

? mins it will fill 20 l 🡪 12 mins

16. Coins of 1, 2 and 5 rupee coins are tossed. What is the probability of getting a head on the 1 rupee coin, tail on the 2 rupee coin and a head on the 5 rupee coin?

Probability of getting HTH combination

1 rupee COIN , 2 rupee COIN , 5 rupee COIN

H,T H,T H,T

H T H

1 / 2 \* 1 / 2 \* 1 / 2 = 1 / 8

{HHH,TTT,HTH,THT,THH,TTH,HHT,HTT} = 1/ 8

17. Train A takes 16 hours to reach M urn bai from Delhi while Train B takes 20 hours. The ratio of the speeds of oath the trains (A:B) is

Time taken by Train A = 16 hrs

Time taken by Train B = 20 hrs

Time ratio A & B = 16 : 20 = 4 : 5

Speed ratio A & B = 1/4 : 1/5= 5 : 4

Time is inversely proportional to speed and vice versa.At constant Distance.

Time ratio of Train A : Train B : Train C = 4 : 5 : 6 = 1/4 : 1/5 : 1/6 = 15 :12 : 10 🡪Speed ratio

Time & Speed are inversely proportionate for constant distance

Time ratio of Train A : Train B = 4 : 5

Speed ratio of Train A : Train B = 1/4 : 1/5 = 5 : 4

ABC 3! = 6 No of permutations were A & B are not together.

ACB No of Permutations were A & B are not together = Total – No of permutations were A & b are together.

BAC 2 = 6 - 4

BCA

CAB

CBA

ABC = 2! \* 2! = 4 WAYS

18. If we permute 5 letters of the word 'lemon' in to 5! words. In how many words vowels do not come together?

LEMON can be permutated in 5! =120 words

No of words were vowels are not together = Total words - No of words were vowels are together

No of words were vowels are together LMNEO = 4! \* 2! =24 \* 2 = 48

No of words were vowels are not together = 120 – 48 = 72.

LEMON🡪LMNOE = 4! \* 2! =24 \* 2 = 48.

ABC, BCA,ACB,CBA= 2! \* 2!=4

No of cases where BC do not come together = total – cases in which BC come together

= 6 – 4 = 2 (BAC,CAB)

ACB

BAC

BCA

CAB

CBA

SUCCESS = 7! / 3! \* 2! =

3- S ,2- C

SCCSSUE = 6! / 3! \* 2!

19. Mehak was in a whimsical mood and to reach her home from her office she took the following steps- 4 steps towards North, 3 steps towards East , 8 steps towards South, 6 steps towards West, 7 steps towards North,4 steps towards East, 6 steps towards South, 4 steps towards west finally reached her home taking 3 steps towards North. The location of Mehak's home with respect to her office is:

3 3

5 4

H 2 OFF 6 8

7 3

4

6

ANS : 2KMS WEST

20. (3 / 7) + (22 4 / 7) – (2 / 8) div by 1/ 4

(3 / 7) + (158 / 7) – (2 / 8) div 1 / 4

(161 / 7) – (2 / 8) div by 1 / 4

(161 \* 8 – 2 \* 7) / 56 div by 1 / 4

1288 – 14 / 56 div by 1 / 4

(1274 / 56) / (1 / 4)

1274 / 14 = 91.