



# Assignment

M.Sc. Zoology  
Semester-II

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Title of Assignment:

# PROBABILITY DISTRIBUTION

BINOMIAL, POISSON, NORMAL

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Roll Number:

01.

## CONTENT:-

1. Distribution

2. Types of Probability Distribution

2.1 Discrete PD ✓

2.2 Continuous PD ✓

$\frac{4\frac{1}{2}}{5}$   
18/3/19

3. ✓ Probability Distribution
4. ✓ Binomial Distribution
  - 4.1 Measures of Central tendency and Dispersion for the Binomial distribution.
5. ✓ Poisson Distribution
  - 5.1 Characteristics of Poisson distribution.
6. ✓ Normal Distribution
7. ✓ Defecting a Normal Distribution
8. ✓ Areas under the normal Curve.
9. ✓ Area under the curve
10. ✓ Standard Normal PD.

## DISTRIBUTION :-

→ Frequency Distribution :- It is of actual & observed

frequencies of all the outcomes of an experiment that actually occurred when experiment was done

② Probability Distribution :- It is a ~~possibility~~ listing of probabilities of all the possible outcomes that could occur when experiment was done.

→ It can be described as

- A diagram
- A table
- A mathematical formula.

## TYPES OF PROBABILITY DISTRIBUTION :-

Probability Distribution

Discrete

PD

→ Binomial  
distribution

→ Poisson  
distribution

Continuous

PD

→ Normal  
distribution.

## \* PROBABILITY DISTRIBUTION :-

① Continuous Distribution :-  
Random

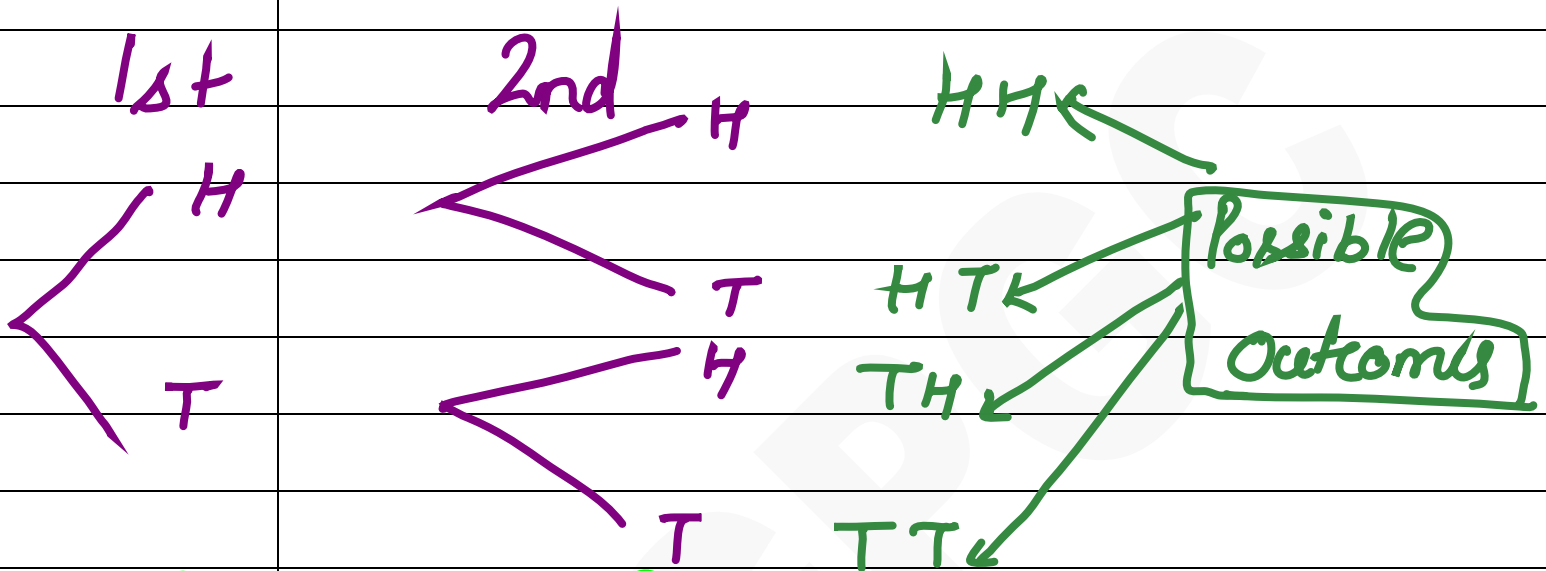
Variable can take any value  
eg → Height of student in  
the class.

② Discrete Distribution :- Random

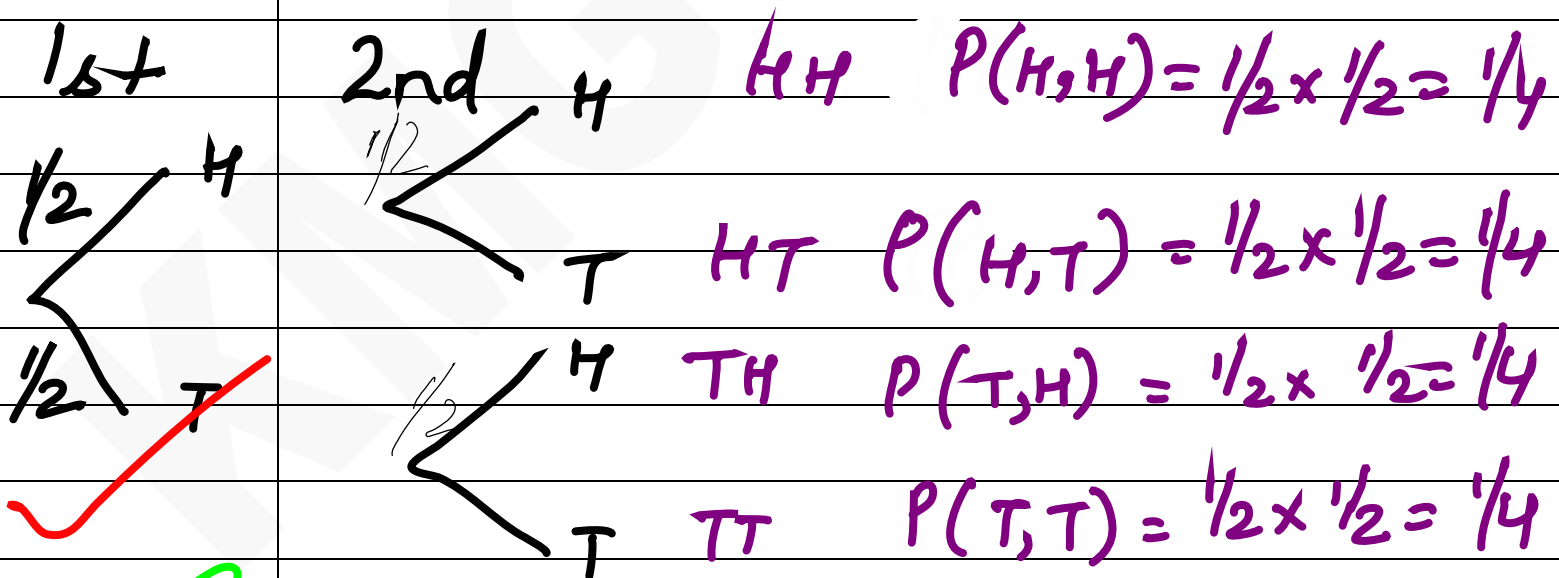
Variable can  
take any limited number of  
value. Eg → No. of heads in  
two tosses.

# TREE DIAGRAM:-

A Fair Coin is tossed twice.

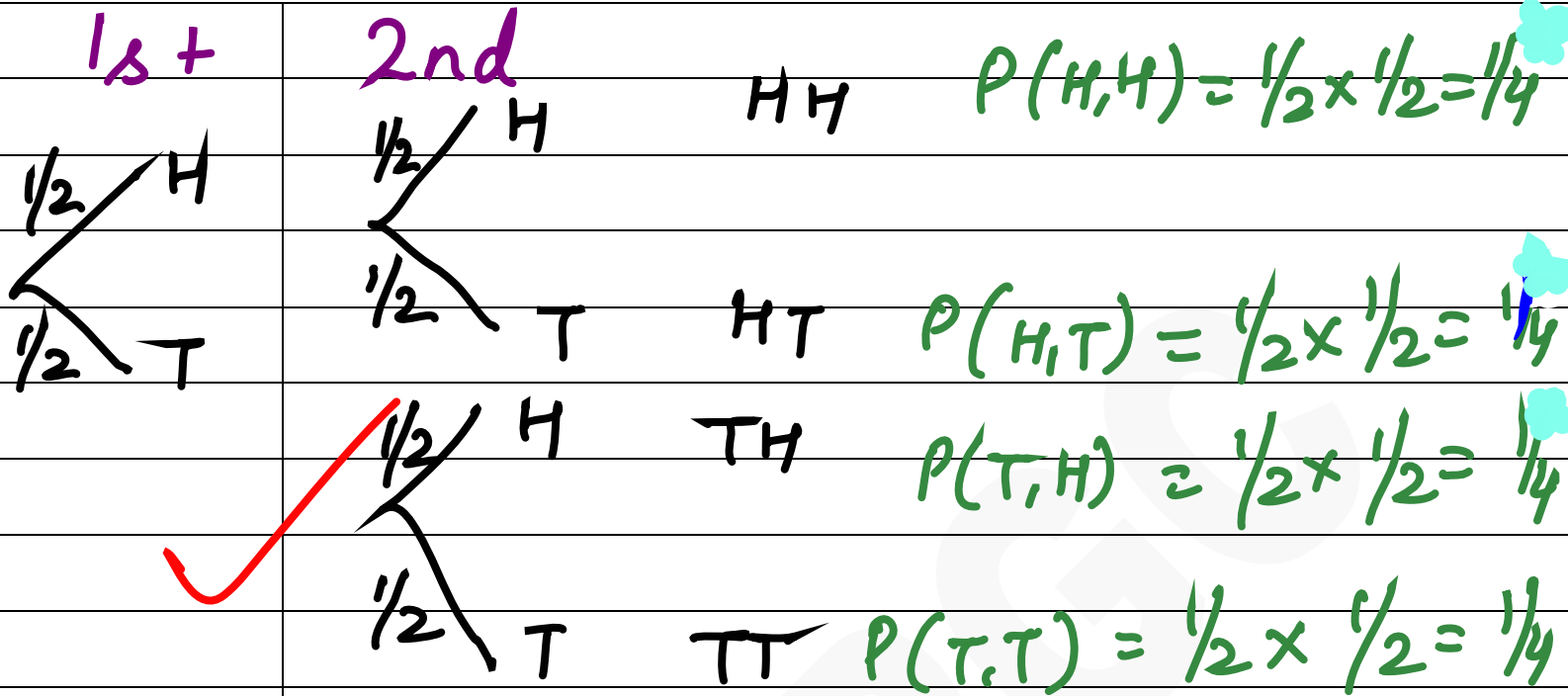


## \* ATTACH PROBABILITIES:-



## \* CALCULATE PROBABILITIES:-





Probability of at least one head?

Ans  $\Rightarrow \frac{1}{4} + \frac{1}{4} + \frac{1}{4} = \frac{3}{4}$

## \* DISCRETE PD :-

o) Tossing a coin three times:-

$S = (HHH, HHT, HTH, HTT, TTH, THT, TTT) \dots$

let 'x' represent "no. of heads"

X	frequency	$P = x(x)$
0	1	$1/8$
1	3	$3/8$
2	3	$3/8$
3	1	$1/8$

# BIONOMIAL DISTRIBUTION:

→ There are certain phenomenon in nature which can be identified as Bernoulli's process in which:-

- There is a fixed no of  $n$  trials carried out
- Each trials has only two outcomes say success or failure, true or false etc
- Probability of occurrence of outcome remains same over successive trials.
- Trials are statistically active.



• Binomial distribution is a discrete PD which express the Probability of one set of alternatives of Success (p) and failure (q).

•  $P(X=x) = {}^n C_x p^x q^{n-x}$  (Prob. of  $x$  success in  $n$  trials.)

⇒  
 $n$  = no. of trials taken  
 $x$  = no. of successes desired  
 $p$  = Probability of Success  
 $q$  = Probability of failure.

## \* Measures Of Central Tendencies AND DISPERSION FOR THE BINOMIAL DISTRIBUTION:-

o) Mean of BD:  $\mu = np$

o) Standard deviations of BD:  $\sigma = \sqrt{npq}$

# \* POISSON DISTRIBUTION:-

⇒ When there is a large no. of trials but a small probability of success, binomial calculation become impractical.

⇒ If  $\lambda$  = mean no. of occurrence of an event per unit interval of time / space, then probability that will occur 'x' times is given by

$$\rightarrow P(x) = \frac{\lambda^x e^{-\lambda}}{x!} \text{ where } e$$

is Napier constant &  $e = 2.7182$

## \* CHARACTERISTICS OF POISSON DISTRIBUTION:-

○ It is a discrete distribution.

- o Occurrences are statistically independent
- o Mean no. of occurrence in a unit of time is proportional to size of unit.
- o Mean of PD is  $\lambda = np$
- o Standard deviation of PD is  $\sqrt{np}$ .
- o It is always right skewed.
- o PD is a good approximation to BD when  $n > 0.4 = 20$  and  $p < 0.4 = 0.05$ .

Please Turn Over  
ON Part 2nd  
(2nd assignment).

Try to complete in short