CA Foundation

Statistics

Formula Revision Sheets

Instruction

- ✓ *Get at least **5-10 Print Outs** of This Sheet.*
- ✓ *At **Regular Interval** Fill Complete Sheet it will Help You **Retain Formula.***
- ✓ *Try to Stablish Linking of Formula with Concepts & Questions.*
- ✓ *Try to **add practice of Questions** with Every Revision*

"Practice leads to perfection and perfection leads to succession"

Your Math's Professor

Aman Khedia

Write Down Basic Tricks

How to Calculate Any Power

How to Calculate Log

How to Calculate Antilog

Basic Math's Formal's

Basic Tips

Measure of Central Tendency

All the Formula of Measures of Central Tendency

S.no	Particulars	Individual Series	Discrete Series	Continuous Series
1.	Mean			
2.	Patriation Value			
Things to Keep in Mind in PV. (Don't Forget to arrange Data in Ascending Orders 1st)		*If Outcome in Decimal?*	*Where to Check Outcome of Formula?*	*How to Proceed?*
3.	Mode			
4.	Geometric Mean			
5.	Harmonic Mean			

Combined Mean Formula

S.no		Arithmetic Mean	Geometric Mean	Harmonic Mean
1	**Combined Formula** Exist Only for Mean **Not for** Mode & PV.			

Relation Between Mean Median & Mode

Data Given	Symmetric Data	Asymmetric Data		
	(It means all are Same)	Positively Skewed	Negatively Skewed	Moderately Skewed

Relation Between AM GM & HM

Data Given	Symmetric Data (It means all are Same)	Asymmetric Data (For the set of **Distinct positive** observation)
1.		
2.	If question silent whether data is symmetrical or Asymmetrical:	
Common Property (Scale & Origin)	Refer Page no-	

Measure of Dispersion

All the Formula of Measures of Dispersion

S.no	Measure	Absolute Measure	Relative Measure
1.	Range	Individual Series Discrete Series Continuous Series	
2.	Mean Deviation	Individual Series Discrete Series Continuous Series	
3.	Quartile Deviation		
4A.	Standard Deviation	Individual Series: Direct Method; Indirect Method Discrete Series Continuous Series	
4B.	Variance		
4C.	Combined Standard Deviation		
Mis Point:	**M.D of** 1^{st} n natural no =	**S.D of** 1^{st} n natural no =	
Relationship Between QD: MD:SD =			
Common Property (Origin & Scale):		Refer Page no-	

Correlation Analysis

Formula to Calculate Coefficient of Correlation (r)

- Scatter Diagram
- Karl Pearson Product Moment
  - *If all the Observations are Given*
- Spearman Rank Correlation
- Coefficient of Correlation
- *If Covariances is Given or we can find?* → Covariance

Errors

- Probable Error
  - *Properties of Probable Error*
- Standard Error
- Correlation of Population

Other Important Highlights

- Coefficient of Determinant
  - *Theoretically*
- Coefficient of Non-Determinant
  - *Theoretically*
- Coefficient of Alienation
  - *Theoretically*

Regression Analysis

Complete Overview & Revision of Chapter

AIM-1 — Regression Coefficient

We Need **Equation** So that we Can Value of **One Variable** & Get **Another Variable**

AIM-2 — Regression Equation

Equation Formula Use Two Variable One is **Regression Coefficient** (b_{xy}, b_{yx})

AIM-3 — To Estimate the Value

We Need **Equation** So that we Can Value of **One Variable** & Get **Another Variable**

Y on X

General Form

Here **a** & **b** are Reg Parameters (**Use** this Formula When Value of **a** & **b** is **Given** or You can **Find**)

Point Form

Here (b_{yx}) can be Given if Not You have to Calculate Using **AIM-1 &** ($\bar{X}$ & $\bar{Y}$) are Normal Arithmetic Means

X on Y

General Form

Here **a** & **b** are Reg Parameters (**Use** this Formula When Value of **a** & **b** is **Given** or You can **Find**)

Point Form

Here (b_{yx}) can be Given if Not You have to Calculate Using **AIM-1 &** ($\bar{X}$ & $\bar{Y}$) are Normal Arithmetic Means

Formula

Students Usually Get Confused When to apply which formula

(**You have to think about formula according to information given in Question)**

Given Info	b_{yx}	b_{xy}
All Obs Given		
SD & r Given		
Cov Given		

Question: The regression coefficient of Y on X (b_{yx}) of the following data cov. (X ; Y) = 121; σ x = 15 ; σ y = 14 is

Question: The regression coefficient of X on Y of the following data: N = 10; ΣX = 250; ∑Y = 210; Σ(X-25)² = 262; Σ (Y - 21)² = 322, Σ (X - 25) (Y - 21) = 192 is

Question: Find the regression equation from the following data:
If ∑X = 34, ΣY = 56, ΣXY = 351, ΣX² = 234, ΣY² = 554, N = 6
Hence estimate Y when X is 10 and estimate also x when Y is 12.

(a) 12 & 13 **(b)** 12.60 & 15.89
(c) 11.76 & 15.30 **(d)** none of these

Relationship Between Correlation & Regression

Practical Formula

If r = ± 1 then Regression Lines are

If r = 0 then Regression Lines are

Important Highlights

Regression Coefficients (b_{yx}) & (b_{xy})

- About Unity
- About Sign
- About Intersection
- Incorrect to Correct

How to identify Regression Lines

- Step-1
- Step-2
- Step-3

What You Should Think If You See Following Inputs in Question?

1. $\sum(x-\bar{x})(y-\bar{y})$ →
2. $\sum(x-\bar{x})^2$ or $\sum(y-\bar{y})^2$ →
3. Regression Lines are Given $(2X+3Y+5=0)$ →

Summary Based Revision Questions

Question: For the variables x and y, the regression equation is given as **7x – 3y – 18 = 0** and **4x – y – 11 = 0**

i. Find the arithmetic means of x and y.

ii. Identify the regression equation of y on x.

iii. Compute the correlation coefficient between x and y.

iv. Given the variance of x is 9, find the SD of y.

Question: Compute Coefficient of Correlation from following information Regression equation of Y on X is 45X – 5Y + 15 = 0 and Regression equation of X on X is 9X – 100Y + 30 = 0

Question: If Cov (x, y) =16 and Variance of x = 25, Variance of y = 16 and $\bar{X}$ = 20,$\bar{Y}$ = 30
Estimate Y if X = 30

Question: If the slope of regression line is calculated to be 5.5 and the intercept 15, then find the value of y when x is 6?

Question: If Y = 9X and X = 0.01Y then r is equals to?

Common Property Summary

Common Property Means **Change** is **Origin** & **Scale** What Change Will Happen in **(MOCT & MOD)** or **(Correlation & Regression Analysis)** if Observations are Changing by Shifting their Origin & Scale.

Univariant Data
(Single Variable Data)

Bivariant Data
(Two Variable Data)

Measure of Central Tendency **(MOCT)** & Measure of Dispersion **(MOD)** are **Single Variable** Chapters.

Correlation Analysis **(CA)** & Regression Analysis **(RA)** are **Two Variable** Chapters.

Since there is Only **1 Variable**

Since there is Only **2 Variable**

Standard Form

Standard Form

Measure of Central Tendency & Dispersion

MOCT

Origin →

Scale →

MOD

Origin →

Scale →

Question: If the relationship between x and y is given by **2x + 3y = 10 (a)** And if the Mean of x is Rs 2, what would be the Mean of y? **(b)** And if range of x is Rs 15, what would be the range of y?

Correlation Analysis & Regression Analysis

Correlation Analysis

Origin →

Scale →

Regression Analysis

Origin →

Scale →

Question: If $u + 5x = 6$ and $3y - 7v = 20$ and the correlation coefficient between x and y is 0.58 then what would be the correlation coefficient between u and v?

Question: If $u = 2x + 5$ and $v = -3y - 6$ and regression coefficient of y on x is 2.4, what is the regression coefficient of v on u?