IBN-SAIDAT

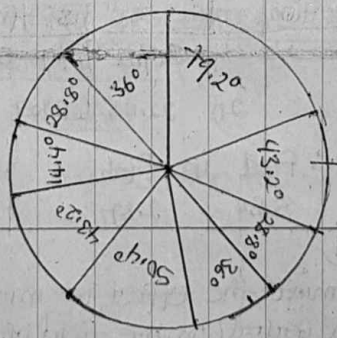
BIO-209 SECOND SUMMARY

BIOSTATISTICS

* Using table and diagram; Row data.

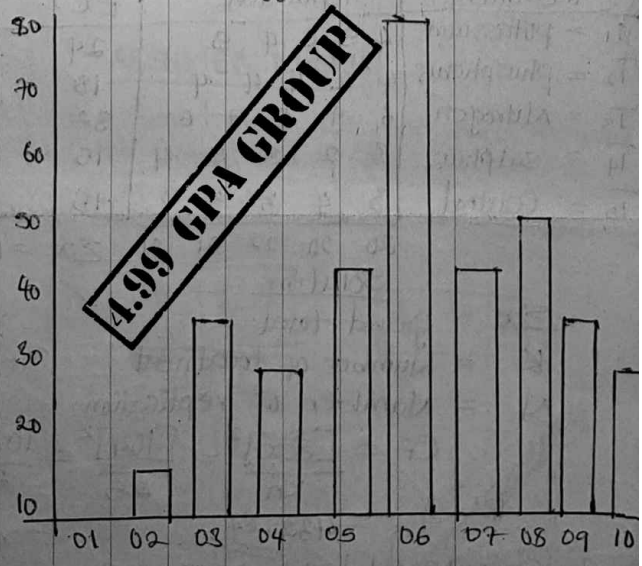
05	06	08	05	09	03	06	05	06	07
06	08	07	02	10	07	08	08	05	06
03	06	06	04	06	08	07	02	07	05
03	09	09	07	04	09	06	08	09	04
06	10	10	08	04	05	06	03	08	10

X	Tally	Frequency	relative F	pie chart.
10	IIII	4	8%	$4/50 \times 360 = 28.8$
09	⧸⧸⧸⧸	5	10%	$5/50 \times 360 = 36$
08	⧸⧸⧸⧸ II	7	14%	$7/50 \times 360 = 50.4$
07	⧸⧸⧸⧸ I	6	12%	$6/50 \times 360 = 43.2$
06	⧸⧸⧸⧸ ⧸⧸⧸⧸ I	11	22%	$11/50 \times 360 = 79.2$
05	⧸⧸⧸⧸	6	12%	$6/50 \times 360 = 43.2$
04	IIII	4	8%	$4/50 \times 360 = 28.8$
03	⧸⧸⧸⧸	5	10%	$5/50 \times 360 = 36$
02	II	2	4%	$2/50 \times 360 = 14.4$
		=50	=100%	=360°



Representation in PIE-CHART

=360°



Representation in BAR-CHART

*ANOVA – Analysis of variance group because Campasion are made between the two sample.

TYPES OF ANOVA

* Single factor or one way ANOVA
* Double factor or two way ANOVA
  a) Two way ANOVA with replication.
  b) Two way ANOVA without replication.
* Multiple factor ANOVA

CHARACTERISTICS OF ANOVA

- They are Independent characters
- Variance is based on variability between group and frequency
- Obtain result of the difference

STEP IN SOLVING ANOVA

- We first find out correction factor (CF)

$$CF = \frac{[\Sigma x]^2}{KN}$$

where:-
K = number of treats
N = no of replication.

- Compute total sum of square (SSt)
  ∴ SStotal = sum of square
- Treatment sum of square.
  ∴ $SS\text{treatment} = \frac{\Sigma T^2}{n} - CF$
- Compute sum of square error [SSE]
  ∴ SSE = SStotal – SStreatment.

* ANOVA TABLE

Sum of variation	df	sst	mss	fcal	ftab
Treatment	4	~~3.88~~ 1.8	~~0.9~~ 1.9	8.84	2.87
Error	20	22.4	[1.12]		

∴ fcal vs. ftab
8.84 2.87

- Example (1)

To determine the effect of mineral nutrient [N, P, K, S with Control] on the field of orange [we add CF horizontally and vertically]

Treatment	replication					Σx
T_1 = potassium	4	5	6	4	5	24
T_2 = phusphorus	4	2	4	4	4	18
T_3 = Nitrogen	6	7	6	7	6	32
T_4 = Sulphur	3	2	3	3	4	15
T_5 = Control	3	4	3	3	2	15
	20	20	22	21	21	Σx = 104

Solution

Σx = grand total
K = Number of treatment
N = Number of replication

$$CF = \frac{[\Sigma x]^2}{Kn} = \frac{[104]^2}{25} = \frac{10816}{25}$$

$$= 432.64$$

2. Compute total sum of square.

$$[4^2 + 5^2 + 6^2 + 4^2 + 5^2 \ldots\ldots 2^2] - CF$$

$$= 486 - 432.64 = 53.35$$

∴ SStotal = 53.35

3. Compute the treatment sum of square

$$SSt = \frac{\Sigma T^2}{n} - CF$$

$$\frac{[24^2 + 18^2 + 30^2 + 15^2 + 15^2]}{5} - CF$$

$$= \frac{2374}{5} - 432.64$$

$$= 474.8 - 432.64$$

$$= 42.16$$

$CF = 432.64$

$SStreat = 42.16$

$SStotal = 53.35$

$SSE = SStotal - SStreatment = 53.35 - 42.16$

$= 11.19$

Using one way ANOVA table

Sum of variation	df	SStreat	mss	fcal	ftab
treatment	4	42.16	11.54	18.82	42
Error	20	31.36	[0.50]		

$n = 25$

$K = 5$

$= 25 - 5 = 20$

$SStreat = K - 1$

$SSerror = n - k$

$SStotal = n - 1$

MEASUREMENT OF CENTRAL TENDENCY

* UNGROUPED DATA

- MEAN

• find the mean of the following ungrouped data 6 8 10 12 15

Solution

$$mean = \sum_{i=1}^{n} x$$

$= 6 + 8 + 10 + 12 + 15$

$= 51$

- ASSUMED MEAN

• Find the assumed mean using assumed method of 10, find the actual mean of these scores

8, 9, 10, 12, 15

Solution

$$\bar{x} = A + \frac{\sum_{i=1}^{n} d}{n} \qquad d = x - A$$

$= \Sigma d = 4$

$= 10 + \frac{4}{5}$

$= 10 + 0.80$

$= 10.80$

- If the question provide column [F] the formular will be

$$\bar{x} = A + \frac{\Sigma fd}{\Sigma f}$$

- MEDIAN

• Find the median of following number
1, 5, 6, 2, 4, 8, 9, 11, 13

Solution

rearrangement = 1, 2, 4, 5, 6, 8, 9, 11, 13

median = 6

- If we have 2 median, then will be

$$\frac{x+y}{2}$$

- MODE

• Find the mode

1) 1, 3, 5, 7, 9, 11 = no mode
2) 1, 2, 2, 3, 3, 4, 5, 6 = 2 mode
3) 1, 2, 2, 3, 3, 4, 4, 5, 6, 9 = 3 mode

- the common number that appears more than one.

* GROUPED DATA

- MEAN

$$\bar{X} = \frac{\Sigma fx}{\Sigma f}$$

- MEDIAN

$$L_1 + \left(\frac{\frac{n}{2} - \Sigma f_1}{f_{median}}\right)c$$

Parameters

f_{median} = freq. of the median class.

Σf_1 = sum of lower median class interval

L_1 = lower class intervals.

- MODE

$$L_1 + \left(\frac{D_1}{D_1 + D_2}\right)c$$

Expansion

L_1 = lower class boundary of the model class.

c = class interval size.

D_1 = frequency of model class minus the frequency of the next lower class.

D_2 = frequency of the model class minus the frequency of next higher class.

PROBABILITY FORMULARS

$$P(r) = {}^nC_r p^r q^{n-r} = \frac{n!}{r!(n-r)!p^r q^{n-r}}$$

VARIABLE PROBABILITY

Mean = pn

Standard deviation = $\sqrt{npq}$

Variance = npq

standard error = $\frac{\sqrt{npq}}{\sqrt{n}}$