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Subject: Statistics Test No. WT-8 Date:

	A	B	C	D		A	B	C	D		A	B	C	D		A	B	C	D
1	○	●	○	○	6	○	○	○	○	11	○	○	○	○	16	○	○	○	○
2	○	○	○	●	7	○	○	○	○	12	○	○	○	○	17	○	○	○	○
3	●	○	○	○	8	○	○	○	○	13	○	○	○	○	18	○	○	○	○
4	○	○	○	○	9	○	○	○	○	14	○	○	○	○	19	○	○	○	○
5	○	○	○	○	10	○	○	○	○	15	○	○	○	○	20	○	○	○	○

Marks Obtained

Subjective Type

Question no 2:

(i)

Attribute:

A characteristic that cannot be expressed numerically is called attribute or qualitative variable. An attribute is also called as categorical variable.

Example: → Eye colour of students, etc

(ii)

Independant Attribute:

Two attributes 'A' and 'B' are said to be independant, if there is no relationship of any kind.

Example: $(AB) = \frac{(A)(B)}{n}$

(iii)

Solution:

Given:

$n = 100$; $(A) = 40$; $\alpha = ?$

We know that

$(A) + (\alpha) = n$

Therefore

$\alpha = n - (A)$

$\therefore \alpha = 100 - 40$

$\boxed{\alpha = 60}$ Ans

(iv)

Solution:

Given data:

$n = 1024$; $(A) = 640$; $(B) = 384$; $(AB) = 54$

We know that

$$(AB) = \frac{(A)(B)}{n}$$

$$54 = \frac{(640)(384)}{1024}$$

$54 \neq 240$.

since

$$(AB) \neq \frac{(A)(B)}{n}$$

Hence attributes are associated.

Question no 3:

→ Expected frequency:

attribute	Attached	Not attached	Total
inoculated	528 (480.14)	25 (72.86)	553
Not inoculated	790 (837.86)	175 (127.14)	965
Total	1318	200	1518

↳ GT

f_o	f_e	$f_o - f_e$	$\frac{(f_o - f_e)^2}{f_e}$
528	480.14	47.86	4.77
790	837.86	-47.86	2.733
25	72.86	-47.86	31.44
175	127.14	47.86	18.016

$\Sigma = 56.959$

→ Null Hypothesis

H_0 = There is no association

→ Alternate Hypothesis

H_1 = There is association

→ level of significance

$\alpha = 0.05$

$1 - 0.05 = 0.95$

→ Test statistics

$$\chi^2 = \sum \left[\frac{(f_o - f_e)^2}{f_e} \right]$$

→ critical region:

$$V = (r-1)(c-1)$$
$$(2-1)(2-1)$$

$$V = (1)(1)$$
$$V = (1)$$

$$\chi^2_{\alpha(1)} = \chi^2_{(0.05,1)} = 204.05$$

→ Conclusion:

Since χ^2 lies in critical region

so, there is Association

→ Test statistics

$$\chi^2 = \sum \left[\frac{(f_o - f_e)^2}{f_e} \right]$$

→ critical region:

$$V = (r-1)(c-1)$$
$$(2-1)(2-1)$$

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→ Conclusion:

Since χ^2 lies in critical region

so, there is Association