① Q. Basi Assumption of Bionomial Distribution:

Ans. Bionomial Distributions

Are That There is only one outcome of each trial That each trial has The same probility of Success and Each trial is mutally exclusive or Independence of each others.

Bionomial Radom Distribution Based on a fair Coins

Suppose we have a fair Coin. so The head - on probility and we flip it 3 times If we let The radom value x represent The number of head in The 3 tosses. Then Clearly x is a Discrete radom variable and Can Take values

(5) Assumption s of Bionmial Distributions

which is. the Generalised version of a fixed Number of coin flips.
Here are The Assumptions of The ~~Bion~~ Binomial Distribution That were listed in The lealture.

(1) There are fixed Number of trials
(2) Each trial has 2 out come (Called succes or failure)
(3) The trial are Independent of one another.
(4) The probility of Success is The Same for all trails.

Q2 (3)
(b) If x is Binomially Distributed with 8 trials and probility of success equlty 3/4 at each attempt

(i) Exactly 5 success (ii) At least one success.

at Binomal Distribution,

$n=8$, $n=5$

fomula.. $n=8$ $p=3/4$ $q = 1-3/4 \Rightarrow 1/4$

$P(5 \text{ Successes}) \; {}^{}C_5 (3/4)^5 (1/4)^{8-5}$

$\Rightarrow \frac{8!}{(8-5)!\,5!} \cdot (3/4)^5 (1/4)^3$

$(0.15)^5 (0.2)^3$

$\frac{40320}{120}$

$(336)(0.237)(0.008)$

$\boxed{P = 0.63}$

1) at least one success

$n = 8$, $x = 1$

$\Rightarrow \; {}^{8}C_{1} \left(\frac{3}{4}\right)^{1} \left(\frac{1}{4}\right)^{8-1}$

$\Rightarrow \frac{8!}{(8-1)!\,1!} \left(\frac{3}{4}\right) \left(\frac{1}{4}\right)^{7}$

$\frac{40320}{5040} \quad (0.75)(0.2)^{7}$

$(8)\,(0.75)\,(0.0000128)$

$\boxed{P = 0.0000768}$

7

Qsn 8 Z-TEST AND ANOVDA

ANS: Z-TESTS → A Z TEST 'S

Statistical test used to determine whether two population mean are different. when the variances as known and The Sample size is Large. The test statistic is assumed to have a normal Distribution and nuisance parameters Such as Standard deviation Should be know in order for an accurate Z-test. h be performed

A Z-Statistic or Z- Score is a number representing how many Standard deviations above or below The mean Population a score derived form a Z-test is

(6) ANOVA Test:

ANOVA is a statistical technique that asses potential differences is a scale-level dependent variable by a nominal-level variable having two or more categories. The use of ANOVA depends on the research design. in three ways.

1) Oneway ANOVA: A one way Anova has just one independent variable.

2) Two way ANOVA: A two way Anova ar also called factorial Anova refer to an Anova using two independent variables

(7) N-Way ANOVA:

A researcher can also use more than two independent variables and this is an n-way Anova with n being the number of independent variables you have.

Q3: part (B) write down the Basic assumption for chi-square test:

Ans: Chi-Square Test: A chi-square test also test they can used statistical hypothesis test that is valid to perform when the test statistic is chi-square distributed under the null hypothesis, specifica Pearson's chi-square test is an variants there of.

(8) There are two types chi-square tests

* A chi-square goodness of fit test.

if a sample data matches a population
For more details on this type
see goodness of fit test.

* A chi-square test for independence.

Compare two variables in a
Contingency table to see if they
are related. In a more general
sense. it tests to see
whether distribution of categorical
variables differ from each other.

Qu.No ① The p.d.f of The ages of babies x years being brought to a post-natal clinic is given by

$$f(x) = \begin{cases} \frac{3}{4}x(3-x) & 0 < x < 2 \\ 0 & \text{other wise} \end{cases}$$

Solution: Eight months $= \frac{2}{3}$ years. so

$$P(x < \tfrac{2}{3}) = \int^{2/3} \frac{3}{4} x(2-x)\,dx$$

$$= \frac{3}{4} \int_0^{2/3} (2x - x^2)\,dx$$

$$= \frac{3}{4}\left(x^2 - \frac{x^3}{3}\right)^{2/3}$$

$$= \frac{3}{4}\left[\frac{4}{9} - \frac{8}{81}\right] - [0]$$

$$= \frac{3}{4} \cdot \left[\frac{28}{81}\right] = \frac{7}{27} \Rightarrow 0.259$$

So The Expected number of Babies under 8 months

(10)

⇒ Total Babies = 45

⇒ 45 (0.259)

⇒ $\boxed{11.655}$

Q1 Students at multiple Grade Schools were asked what Their personal Goals (Get Good Grades be popular, be Good at sports was and How Importance having money were to Them (1 very Important and 4 least Important. Do The data provide enough evidence to Show That Goals attainment and Importance of money are Independent at 5% level in following Give table Test.

	Money Important Rating 1	2	3	4	Row Total
Goals	14	34	71	128	247
	14	29	35	63	141
	6	12	26	46	90
	34	75	132	237	478

(11)

O	E	O·E	$(O·E)^2$	$(O·E)^2/E$
				Total
Gol	2	3	4	
Gra 14	24	71	128	247
pop 14	29	35	63	141
Spo 6	12	26	46	90
Total 24	75	132	237	478

1	2	3	4
	38.75	68.209	122.46
17.56			
10.029	22.12	38.93	69.91
6.401	14.121	24.85	44.62

Observed	Expected	O·E	$(O·E)^2$	$\frac{(O·E)^2}{E}$
14	17.56	−3.56	12.67	0.705
34	38.75	−4.75	22.56	0582
71	68.20	2.8	7.84	0.114
128	122.46	5.54	30.69	0.250
14	10.029	3.971	15.76	1.571
29	22.12	6.88	47.33	2.139
35	38.93	−3.93	15.44	0.396
63	69.91	−6.91	47.74	0.682
6	6.401	−0.401	0.160	0.074
12	14.121	−2.121	4.498	0.378
26	24.85	−2.85	8.1225	0.326
46	44.62	−1.38	1.90	0.042

$$\Sigma \frac{(O-E)^2}{E}$$

$X^2 = 6.8$[illegible]

degree of fredom = (columns-1) rows-1

(4-1) (3-1) = 3×2 = 6

Significance level = 0.05

Tabulen value is 12.59

x^2 tabular = 12.59

x^2 calculated = 6.828

x^2 calculated < x^2 tabular