Programe : MBA (90)
Course : Quantitative Techniques for Manager
Instructor: Mr. Raza Ahmed
Name : ABdul Haseeb
ID : 16744.

QNO1:

Solution

	O	E	O-E	$(O-E)^2$	$(O-E)^2/E$
Goal	1	2	3	4	Total
Grades	14	34	71	128	247
Pop	14	29	35	63	141
sport	6	12	26	46	90
Total	34	75	132	237	478
	21	2	3	4	
	17.56	38.75	68.209	122.46	
	10.029	22.12	38.93	69.91	
	6.461	14.121	24.85	44.62	

PTO

Observed value o	Expected value(E)	O - E	$(O-E)^2$	$\left(\frac{O-E}{E}\right)^2$
14	17.56	-3.56	12.67	0.705
34	38.75	-4.75	22.56	0.582
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	0.024
12	14.121	-2.121	4.498	0.318
26	24.85	-2.85	8.1225	0.326
46	44.62	-1.38	1.90	0.042

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

$x^2 = 6.828$

degree of freedom = (column-1)(row-1)

$(4-1)(3-1) = 3 \times 2 = 6$

significance const $= 0.05$

Tabular value is 12.59

x^2 tabular $= 12.59$

x^2 calculated $= 6.828$

x^2 calculated $<$ x^2 tabular.

Qn No 2:

(a) Assumption of Binomial Distribution:-

Here are some assumption of binomial distribution which are as under.

(i) There are fixed number of trial (Represented by the varriable n).

ii) Each trial has 2 outcomes (called "success" and "failure").

(iii) The trial are all independent of one another.

(iv) The probability of success is the same trial. (this probability is represented by p and q represented the probability of failure the opposite of success.

Q2 (b) (i).

Binomial Distribution

$n = 8$, $x = 5$

formula

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

$x = 5$

$$P(5 \text{ successes}) = {}^{8}C_{5} \left(\frac{3}{4}\right)^{5} \left(\frac{1}{4}\right)^{8-5}$$

$$\Rightarrow \frac{8!}{(8-5)!5!} \left(\frac{3}{4}\right)^{5} \left(\frac{1}{4}\right)^{3}$$

$$\frac{40320}{120} (0.15)^{5} (0.2)^{3}$$

$$(336)(0.237)(0.08)$$

Ans $\boxed{P \simeq 0.63}$

Q2

(5)(ii)

At least one success

$n = 8 \quad , x = 1$

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

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

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

$(8)(0.75)(0.0000128)$

$P \approx 0.0000768$

Q3

(a) Differentiate between z-test, t-test & ANOVA test.

Ans z-test:

z-test is a statistical test used to determine whether two population means are different when the variance are known and the sample size is large. The test statistic is assumed to have a normal distribution and nuisance parameter such as standard deviation should be known in order for an acurate z test to be performed. A z statistic is a number representing how many standard deviation above or below the mean population a score devided f z-test is.

whereas

T-test are most help full with a smaller sample size both the ~~distribution~~ method assume a normal distribution of the data.

Then:

ANOVA: is used to compare means between two or more groups of predictor varriables. So for two groups we can use both t-test and ANOVA and the result would be the same.

Q3
(b) write down basic assumption of chi-square test.

Ans: Chi-Square test:

The chi-square test is one of the most useful statistic for testing hypothesis when varriables are normal as often happens in clinical reasearch.

Assumption of Chi-Square test:-

The assumption of chi-square test includes.

1) The data in the cells should be freauincies or count of cases rather than percentage or some other transformation data.

2) However the data may be ~~original~~ ordinal data. Interval or ratio data that have been collapsed into ordinial categories may also be used.

3) while chi saucare has no rule about limiting the number of cells by limiting the number of categories of each variables.

4) Each subject may contribute data one and only one cell in the χ^2. If for example the same subject are-tested over time such that the comparison are of the same subject at Time 1 Time 2 and Time 3.

Q4:

Solution: Eight month = $\frac{2}{3}$ year 30

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

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

$$= \frac{3}{4}\left(x^2 - \frac{x^3}{3}\right)_0^{\frac{2}{3}}$$

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

$$= \frac{3}{4}\left[\frac{28}{8}\right] = \frac{7}{27} \approx 0.259$$

Hence the expected num of babies under 8 months

$$= 45 \times \frac{7}{27} = 11.6 \text{ Ans.}$$