Seat No. : 1644

AL-104

April-2024

BBA., Sem.-IV

CC-210 : Business Statistics

Time : 2:30 Hours] [Max. Marks : 70

Instructions : (1) Only Simple Calculator is permitted.

(2) Statistical table values are given.

1. (A) State the PDF of Normal Distribution and write any 6 properties of Normal Distribution. 7

(B) The observations of the population are 10, 20, 30, 40. Take all possible sample of size 2 with replacement from the population and verify the following results : 7

(1) $E(\bar{y}) = \bar{Y}$

(2) $V(\bar{y}) = \frac{\sigma^2}{n}$

OR

1. (A) In a normal distribution 35% of the observation are less than 45 and 10% are more than 64. Find mean of the distribution. 7

[Z = 0.39 ⇒ A = 0.15 & Z = 1.28 ⇒ A = 0.4]

(B) 10 observations of a population are divided into two strata as follows : 7

Stratum I	2	4	6	10	13	19
Stratum II	12	21	23	24		

Sample of size 3 is taken from the first stratum and that of size 2 is taken from the second stratum, find $V(\bar{y}_{st})$.

2. (A) 50 observations of a sample gave $\sum x_i = 2000$, $\sum x_i^2 = 90000$. Test the hypothesis that the mean of the population is 42. 7

(B) A coin was tossed 200 times and head was obtained for 80 times; can the coin be regarded as biased ? 7

OR

2. (A) Intelligence test given by SY A Division and SY B Division gave the following result : 7

	Mean Score	Standard Deviation	Sample Size
SY A Division	70	8	50
SY B Division	65	10	100

Is the difference in the mean score of SY A Division and SY B Division statistically significant ?

(B) In Public University, 65% of a random sample of 900 college students likes Statistics lectures. In Private University, 35% of a random sample of 1600 college students likes Statistics lectures. Is the difference between two proportions significant ? 7

3. (A) In rechecking of 10 college students increase in marks were as follows : 7

$-2, -3, 4, 2, 0, 2, 5, 7, 9, 6$

Is it reasonable to believe that the rechecking has no effect on the marks ?

$[t_{t(9, 0.05)} = 2.262]$

(B) A sample from a normal population gave the following information : 7

$n = 15, \sum x_i = 300, \sum x_i^2 = 6060$

Test the hypothesis that population mean is 15.

$[t_{t\ (14, 0.05)} = 2.145]$

OR

3. (A) Is the difference in the performance of the following students significant ? 7

Bobby	Sunny	Karan	Arjun
32	33	35	45
34	35	54	25
35	24	35	34
36	15	55	36

$[F_{((3, 12), 0.05)} = 3.49]$

(B) Following information is obtained from 15 observations : 7

$\bar{x} = 45, \sum (x_i - \bar{x})^2 = 60$

Find 99% confident interval for population mean.

$[t_{t\ (14, 0.01)} = 2.977]$

4. (A) Fit Poisson Distribution. 7

x	0	1	2	3	4
f	45	30	25	20	8

$[e^{-1.34375} = 0.2608]$ $[\chi^2_{(4, 0.05)} = 9.49]$

(B) From a population with median 6 following sample is drawn at random : 7

13, 9, 15, 8, 10, 14, 18, 4, 12, 10, 7, 5

Check whether the population median is 6 or not ?

(Critical value at 5% is 2)

OR

4. (A) A sample of size 6 from a normal population gave $\bar{x} = 30$ and $\sum (x_i - \bar{x})^2 = 180$.

Test the hypothesis H_0: $\sigma^2 = 25$ 7

$[\chi^2_{(5, 0.05)} = 11.07]$

(B) Check randomness of following sample : 7

M, M, M, F, F, M, M, F, M, M, M, M, F, F, F, F, M, M, M

[Critical values of runs for $n_1 = 13$ & $n_2 = 7$ from Table-1 & Table-2 ($C_1 = 5$ & $C_2 = 15$)]

5. Answer the following : (Attempt any 7) 14

(1) In sampling without replacement, the total number of samples each of size 'n' drawn from population of size 'N' is _____ .

(2) Sample survey is to obtain reliable information about the population in less time and at a lower cost. [True /False]

(3) In Simple Random Sampling, each unit of the population has equal chance of selection. [True/False]

(4) Rejecting Null Hypothesis when it is true is known as Type I error. [True/False]

(5) Critical Region is also known as Acceptance Region. [True /False]

(6) In general, the probability of Type I error is fixed and the probability of Type II error is _____ . [Minimized /Maximized]

(7) If $t_{cal} = 0.85$ and $t_{tab} = 2.069$, what decision is taken ?

[H_0 Accepted / H_0 is rejected]

(8) In paired t-test, sample remains the same. [True/ False]

(9) Full form of ANOVA is _____ .

(10) χ^2 – test is to test goodness of fit. [True /False]

(11) In $\chi^2_{tab\,(n-k-1)}$, what is k ?

(12) _____ test is applied when one wants to test the equality of two population mean when normality assumption is not satisfied.
