



LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

M.Sc. DEGREE EXAMINATION - STATISTICS

THIRD SEMESTER – NOVEMBER 2013

ST 3901 - STATISTICAL APPLICATIONS IN BIOLOGICAL SCIENCES

Date : 15/11/2013
Time : 9:00 - 12:00

Dept. No.

Max. : 100 Marks

SECTION – A

Answer ALL questions

(10 x 2 = 20)

1. Define the term Bio-Statistics.
2. What is correlation?
3. State the various measures of central tendency.
4. Define standard error.
5. Write the test statistic for independent t-test.
6. If there are two samples of size n_1 and n_2 respectively with means \bar{x}_1 and \bar{x}_2 , what is the combined mean of the two samples taken together?
7. Write down the properties of Regression.
8. State the applications of Chi-square distribution.
9. Find second quartile from the following data:
36,78,37,73,58,66,97,46,72,87,69
10. Write down the uses of ANOVA .

SECTION – B

Answer any FIVE of the following:

(5 X 8 = 40)

11. Write the short notes on one way analysis of variance.
12. Explain various types of diagrams in statistics.
13. Find Mean, Median and Mode from the following data.

Length of the plant (cms)	20-30	30-40	40-50	50-60	60-70
Frequency	3	5	20	10	5

14. Calculate Bowley's coefficient of Skewness from the given data:

X	3	5	6	4	2	7	6	4
f	9	12	14	16	10	9	11	13

15. The following table gives the number of accidents that occurred during the various days of the week.

Days	Sun	Mon	Tue	Wed	Thu	Fri	Sat
No. Of accidents	16	18	10	22	13	12	15

Test whether the accident are uniformly distributed over the week.

16. In a village A out of random sample of 2000 persons, 200 were found to be vegetarians, while in another village B out of 3000 persons, 360 were found to be vegetarians. Do you find any significant difference in the food habits of the people of two villages?

17. Use the appropriate parametric test to see if there is a difference between the number of days until collection of an account receivable before and after a new collection policy. Use the 5% level of significance.

Before	30	28	40	42	34	28	27	25
After	32	29	37	43	37	27	33	30

18. Obtain the rank correlation co-efficient for the following data:

X	78	74	85	64	90	85	50	65
Y	72	68	78	91	70	78	58	60

SECTION – C

Answer any TWO of the following:

(2 X 20 = 40)

19. (i) The following table shows the ages (X) and systolic blood pressure (Y) of 8 persons:

Age	56	42	60	50	54	49	39	45
Blood Pressure	160	130	125	135	145	115	140	120

Calculate the Karl Pearson's co-efficient of Correlation between age and blood pressure. (8)

(ii) Fit a linear regression equation of Y on X and estimate the blood pressure of a person of 70years.. (12)

20. (i) Calculate Mean, Median, Mode, Quartile deviation and S.D for the given data.

18, 22, 32, 35, 24, 29, 20, 26, 32, 36, 30, 41, 36, 36, 44 (10)

(ii) Calculate first four moments and kurtosis form the given data: (10)

X	11	12	14	15	17	18
F	2	6	20	12	6	3

21. Three researchers determine the moisture content of sample of sand, each man taking a sample from each of four types of lands. Their assessments are given below. (20)

Researchers	Types of land			
	A	B	C	D
X	60	50	58	49
Y	56	58	60	55
Z	49	54	50	49

Test whether there is any significant difference between (i) types of land and (ii) Researchers, at 1 % level of significance.

22. (i) Body length of 8 goats of a species of goat was obtained from two different cities of a country. They were measured as:

Locality A	22	26	22	30	32	34	26	34
Locality B	14	12	10	12	8	6	16	22

Check the null hypothesis $\mu_1 = \mu_2$, where μ_1 and μ_2 are the average goat body lengths of city A and city B respectively, by using independent t-test at 5% level. (10)

ii) In an experiment on immunization of cattle from tuberculosis the following results were obtained:

	Affected	Not affected
Inoculated	24	32
Not inoculated	52	12

Calculate Chi-square and discuss the effect of vaccine in controlling the tuberculosis.(10)
