



**LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034**

**M.Sc. DEGREE EXAMINATION – STATISTICS**

**THIRD SEMESTER – APRIL 2014**

**ST 3901 - STATISTICAL APPLICATIONS IN BIOLOGICAL SCIENCES**

Date : 03/04/2014  
Time : 01:00-04:00

Dept. No.

Max. : 100 Marks

**PART – A**

**Answer all the questions.**

**10 X 2 = 20**

1. State any two applications of Statistics in Bio-Medical science studies.
2. What are the advantages of diagrammatic presentation of data?
3. Write any two sources from which primary *data* are obtained.
4. What do you understand by skewness and kurtosis?
5. Define regression.
6. Write any four characteristics of *Normal distribution*.
7. Define parameter and statistic.
8. What is type I error?
9. Write any two uses of chi-square test.
10. Give the ANOVA of two -way classification.

**PART -B**

**Answer any five questions.**

**5 X 8 = 40**

11. Briefly explain the scope, limitation and misuse of statistics.
12. The following data relate to the monthly expenditure ( in rupees) of the families A and B:

<b>Items of expenditure</b>	<b>Family A</b>	<b>Family B</b>
Food	1800	1600
Rent	1500	1400
Clothing	1200	1100
Light and Fuel	1000	900
Miscellaneous	700	500

Represent the above data by a suitable percentage diagram.

13. Find mean, median and mode for the following data.

126	124	125	150	120	121	151	178	190	204	208	121	113	160	170
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14. Determine quartile deviation and its coefficient for the following tabulation of leaf weights in grams.

Leaf weights	40 - 42	42-44	44-46	46-48	48-50	50-52	52-54	54-56	56-58
No. of leaves	15	18	23	27	36	29	25	21	20

15. Calculate Spearman's coefficient of correlation between height and weight for the data given below:

Height	165	166	171	180	155	163	173	175
Weight	54	59	62	75	50	55	65	75

16. In a certain city 250 men in a sample of 1000 were found to be smokers. In another city, the number of smokers was 750 in a random sample of 2000. Does this indicate that there is greater proportion of smokers in the second city than in the first?

17. The height of the ten males of a given locality are found to be 75, 72, 67, 73, 66, 69, 76, 62, 64, 63 inches. Is it reasonable to believe that the average height is 64 inches? Test at 5% level of significance.

18. In a survey of 200 girls of which 40% were intelligent, 30% had uneducated father, while 20% unintelligent girls had educated fathers. Do these figures support the hypothesis that educated fathers have intelligent girls? Test at 5% level of significance.

#### PART C

**Answer any two questions.**

**2 X 20 = 40**

19. a) Explain the importance of diagrammatic presentation of data.

b) Find the coefficient of variation for the following data.

X	20	56	73	40	42	60	53	66	80
Y	55	59	70	75	79	45	77	66	78

( 8 + 12)

20. Find the two regression equations for the following data:

X	133	156	183	165	199	212	88	156	178	175	189	155
Y	60	63	67	68	78	91	93	91	99	97	82	69

Find the value Y when X = 199 and also Calculate Coefficient of correlation

21. a) Use the chi square test to test if the two attributes in the following contingency table are independent:

Eye colour	Hair colour		
	Fair	Brown	Black
Blue	15	5	20
Grey	20	10	20
brown	25	15	20

Test at 5% level of significance.

b) A certain medicine was given to each of ten patients. The result are given below

Weight before medicine	67	69	80	100	59	81	55	70	61	51
Weight after medicine	60	50	78	93	49	75	53	68	60	45

Use t-test to test the effectiveness of the medicine in reducing the weight. (10 +10)

22. Three varieties of coal were analyzed by five chemists and the ash content in the variety was found to be us under :

Variety	Chemist				
	I	II	III	IV	V
A	59	57	56	55	58
B	57	54	55	54	55
C	55	54	57	56	55
D	53	58	51	59	60

Do the varieties differ significantly in their ash content?

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