

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



**B.Sc. DEGREE EXAMINATION – PLANT BIOLOGY & ADV. ZOOLOGY**

**THIRD SEMESTER – NOVEMBER 2013**

**ST 3203/3201 - BIOSTATISTICS**

Date : 13/11/2013  
Time : 9:00 - 12:00

Dept. No.

Max. : 100 Marks

**SECTION – A**

**Answer ALL questions**

(10 x 2 = 20)

1. Find Mode from the following data  
45, 53, 78, 54, 45, 53, 45, 54
2. Define Bio-Statistics
3. What is type-II error in testing of hypothesis?
4. Write down the ANOVA table for one way classification.
5. What do you mean by mutually exclusive events?
6. If  $n=8$  and  $p=0.6$  in a binomial distribution, find Mean and Variance.
7. State the probability mass function of Poisson distribution.
8. State the properties of Regression.
9. Write down any two advantages of non parametric test.
10. Write the test statistic for testing the equality of the means of two independent populations using t-test.

**SECTION – B**

**Answer any FIVE of the following:**

(5 X 8 = 40)

11. Calculate Arithmetic mean, Median and Mode.

C.I	0-10	10-20	20-30	30-40	40-50
frequency	5	13	17	8	2

12. Explain the steps involved in Chi-square test of independence.
13. Police records show the following numbers of daily crime reports for a sample of days during the winter months and a sample of days during the summer months.

<b>Winter</b>	16	18	10	20	19	18	19	18	24
<b>Summer</b>	17	10	18	33	9	21	19	28	11

Which season has consistent crime rate?

14. The systolic pressure of 10 persons in the age group of 45-50 is given below:

148, 128, 147, 127, 150, 145, 124, 140, 142, 149

Discuss the suggestion that the average systolic pressure of the population is 150.

15. Eight subjects are chosen and the blood pressure is measured for each subject before and after the administration of the drug. The results are as follows:

Subject	1	2	3	4	5	6	7	8
Before	120	115	130	126	138	132	142	132
After	129	123	138	133	140	134	143	133

By using appropriate parametric test, check the null hypothesis that drug have significant effect on blood pressure?

16. Ten girls and eight boys scores in the subject Statistics are as follows:

Boys	32	34	36	35	34	33	36	33		
Girls	34	31	33	32	34	36	31	32	31	35

Test the hypothesis, at the 0.05 level of significance, that the average scores of boys and girls are equal by using Mann-Whitney U-test.

17. Find Karl Pearson coefficient of correlation to the following data.

Birth rate	90	94	100	115	120	130	135
Death rate	88	93	96	98	100	113	133

18. A committee of three is to be chosen from a group consisting of 4 men and 3 women. If the selection is made at random, find the probability that (i) all three are men (ii) all three are women and (iii) two are men.

### SECTION – C

Answer any TWO of the following:

(2 X 20 = 40)

19. (i) Construct regression equation of Y on X and also estimate the weight of the body when length of the body is 35 cms. (10)

Length of the Body(cms) X	10	8	13	16	20	22	28
Weight of the Body (gms)Y	8	6	16	14	18	20	24

(ii) Two diets are compared by conducting an experiment on two sets of experimental animals.

	Diet A	Diet B
No. Of animals	90	120
Mean (in Kg)	15	10
Standard Deviation (in Kg)	3	2

Check the claim that diet B is superior to diet A at 5% level of significance. (10)

20. Set up ANOVA for the following per hectare yield for three varieties of wheat each grown on four plots.

Plot of land	Variety of wheat		
	A	B	C
I	6	5	5
II	7	5	4
III	3	3	3
IV	8	7	4

Test (i) whether the mean yield is the same for the different plots of land and (ii) Whether the mean yield is the same for the different varieties of wheat. (20)

21. (i) A company has 3 establishments namely B1, B2 and B3. The probabilities of producing a defective item by the three establishments are 0.4, 0.3, and 0.12 respectively.
- Find the probability of producing a defective item?
  - If a defective item is selected, what is probability that it has come from B2? (12)
- (ii) From a medical research, the probability of recovery for certain disease is 0.4. If 8 animals are stricken with the disease, what is probability that (a) Exactly one will recover, (b) Exactly two will recover, (c) None will recover, and (d) 6 or more will recover?

(8)

22. (i) A dice is tossed 120 times with the following results:

<b>Number turned up</b>	1	2	3	4	5	6
<b>frequency</b>	20	25	15	10	20	30

Test the hypothesis that the dice is unbiased.

(10)

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

<b>City A</b>	22	26	22	30	32	34	26	34
<b>City B</b>	14	12	10	12	8	6	16	22

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

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