

LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

B.Sc. DEGREE EXAMINATION – PLANT BIOLOGY & PLANT BIO-TECH.

THIRD SEMESTER – APRIL 2010

ST 3203 / 3201 - BIOSTATISTICS

Date & Time: 30/04/2010 / 1:00 - 4:00

Dept. No.

Max. : 100 Marks

PART – A

Answer **ALL** the following:

(10 x 2 = 20)

- 1) Define population.
- 2) Give any two measures of dispersion.
- 3) What is meant by skewness?
- 4) Define regression.
- 5) Find the second quartile of the following data.
49,52,12,87,62,35,21
- 6) Define equally likely events.
- 7) Write down the p.d.f of Poisson distribution.
- 8) State any two properties of normal distribution.
- 9) Give the test statistic of large sample for specified proportion.
- 10) Mention any two advantage of non-parametric tests.

PART – B

Answer any **FIVE** of the following:

(5 x 8 = 40)

11) Calculate median and mode for the following distribution:

Production per day(in tons)	21-22	23-24	25-26	27-28	29-30
No. of days	7	13	22	10	8

12) In a study of the effect of a dietary component on plasma lipid composition, the following ratios were obtained on a sample of experimental animals.

Dietary component	1	5	3	2	1	1	7	3
Plasma lipid level	6	1	0	0	1	2	1	5

Obtain the two regression equations for these data and predict the ratio of plasma lipid level with 4 dietary component.

- 13) Suppose that there is a chance for a newly constructed flyover to collapse whether the design is faulty or not. The chance that the design is faulty is 5%. The chance that the flyover collapses if the design is faulty is 95% otherwise it is 30%. The flyover collapsed. What is the probability that it collapsed because of faulty design?
- 14) Suppose that 30% of a certain population have blood group B. For a sample of size 10 drawn from this population find the probability that (i) exactly three persons with blood group B will be found (ii) three or more persons will be found with blood group B. (4+4)
- 15) A sample of 100 sugarcanes is taken from a field. The mean height is 164 inches and the standard deviation is 6 inches. Can it be reasonably regarded that the sugarcane mean height is 166 inches?

16) A certain drug is claimed to be effective in curing cold. In an experiment on 170 people with cold, half of them were given the drug and half of them given sugar pills. The patient's reaction to the treatment is recorded in the following table:

	Helped	Harmed	No effect
Drug	50	12	20
Sugar pills	42	15	31

Test the hypothesis that the drug is no better than sugar pills for curing cold.

17) The following table illustrates the sample psychological health ratings of corporate executives in the fields of banking, manufacturing and retailing.

Banking	14	16	18		
Manufacturing	14	13	15	22	
Retailing	18	16	19	19	20

Can we consider the psychological health of corporate executives in the given three fields to be equal at 5% level of significance?

18) Use the sign 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	34	35	40	42	33	38	34	45	28	27	25	41	36
After	32	29	33	32	37	43	40	41	37	44	27	33	30	38	36

PART – C

Answer any **TWO** of the following:

(2 x 20 = 40)

19) (a) The height of 12 wheat plants and the number of tillers are given below:

Height (in cms)	188	178	173	164	172	183	184	185	211	217	232	240
No. of tillers	131	130	130	129	129	120	127	127	130	137	140	142

Which of the two characters is more variable? (12)

(a) Calculate the correlation coefficient between height of father and son from the data given below: (8)

Height of father (in inches)	67	64	65	69	70	74	60
Height of son (in inches)	66	67	60	68	73	70	65

20) (a) The average seasonal rainfall in a certain estate is 16 inches with a standard deviation of 4 inches. What is the probability that in a year, the rainfall in that estate will be (i) above 24 inches, (ii) below 12 inches and (iii) between 20 inches and 24 inches ?

(b) 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?

21) (a) 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? (8)

(b) Ten students were given intensive coaching for a month in Statistics. The marks obtained in test 1 and test 5 are given below:

Mark in I test	50	52	53	60	65	67	48	69	72	80
Mark in V test	65	55	65	65	60	67	49	82	74	86

Does the score from test I and test V show any improvement? Test at 5% level of significance. (12)

22) 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
1	6	5	5
2	7	5	4
3	3	3	3
4	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.
