LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

M.Sc. DEGREE EXAMINATION –BIOMED.INSTR.SCIENCE&MED.LAB.TECHN.

THIRD SEMESTER – NOVEMBER 2009

ST 3901 - STATISTICAL APPLICATIONS IN BIOLOGICAL SCIENCES

Date & Time: 07/11/2009 / 9:00 - 12:00   Dept. No.   Max. : 100 Marks

PART – A

Answer **ALL** the following: (10 X 2 = 20)

1) Define Bio-statistics.
2) What are the types of bar diagram?
3) Find mode for the following series:
    34, 36, 45, 40, 27, 65, 45, 48, 62, 25.
4) Give any two measures of dispersion.
5) Define regression.
6) Find the second quartile of the following data.
    49,52,12,87,62,35,21
7) Write down the types of kurtosis?
8) Define level of significance.
9) Give the test statistic of large sample for specified proportion.
10) Give the ANOVA of two-way classification.

PART – B

Answer any **FIVE** of the following: (5 X 8 = 40)

11) Draw a histogram, frequency polygon and frequency curve for the following
    distribution.

Production per day(in tons)	10-20	20-30	30-40	40-50	50-60
No. of days	7	13	22	10	8

12) Find the median and mode for the following data:

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

13) Determine quartile deviation and its coefficient for the following tabulation of leaf
    weights in grams.

Leaf weights	30-32	32-34	34-36	36-38	38-40	40-42	42-44
No. of leaves	12	18	16	14	12	8	6

1

14) 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.

15) In a hospital, out of 1220 babies born, 620 were female babies. Do these figures confirm the hypothesis that male and females are born in equal number? Test at 1% level of significance.

16) Two diets are compared by conducting an experiment on two sets of 80 and 100 experimental animals. The average increase in weight due to the diet A and B are respectively 10 kg and 6 kg with Standard deviation of 1 kg and 1.5 kg. Check the claim that diet B is superior over diet A at 5% level of significance.

17) 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.

18) The following table illustrates the sample psychological health ratings of corporate executives in the field 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?

PART – C

Answer any **TWO** of the following: (2 X 20 = 40)

19) (i) 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

(ii) The number of peas per pod in 7 pods of sugar peas is given below
    2, 6, 5, 7, 3, 4 and 8
    Calculate the four moments, skewness and kurtosis. Infer on it.

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

Height (in cms)	188	178	173	164	072	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)

    (ii) A feeding experiment conducted on 100 experimental animals showed an average increase in weight of 5 kg and the standard deviation of 1 kg. Test the hypothesis that the expected increase is 4 kg against the alternative that it is more at the 5% level of significance. (8)

21) (i) In a village A out of random sample of 2000 person s, 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 the two villages? (8)

    (ii) 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 if significance. (12)

22) 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.

Types of land

Researchers	A	B	C	D
X	50	40	48	39
Y	46	48	50	45
Z	39	44	40	39

    Test whether there is any significant difference between (i) type of land and (ii) researchers. (20)

****

3