LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

B.Sc. DEGREE EXAMINATION – PLA.BIO.&BIOTECHN.,ADV.ZOO.&BIOTECH.

THIRD SEMESTER – NOVEMBER 2009

ST 3203 / 3201 - BIOSTATISTICS

Date & Time: 13/11/2009 / 9:00 - 12:00   Dept. No.   Max. : 100 Marks

PART – A

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

1) Mention any two diagrammatic representations for quantitative data.
2) Give any two merits of median.
3) Find mode for the following series:
    60,64,62,76,70,74,70,84,82,72,76,84,78,84
4) Find the range for the data given below:
    11.5, 12.5, 11.8, 11.7, 13.8, 12.9, 14, 13.1, 14.2, 14.5
5) Define Independent events.
6) If n = 5 and p = 0.4 in a binomial distribution, find the mean and variance.
7) Give the test statistic of large sample for testing the specified mean.
8) Mention any two uses of chi-square distribution.
9) Give the ANOVA of one-way classification.
10) Define correlation.

PART – B

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

11) The production of ghee taken during 5 consecutive days was recorded for 200 cows
    and the frequency distribution is given below:

Ghee (in kg)	2-4	4-6	6-8	8-10	10-125	12-14	14-16
No. of cows	4	60	50	36	30	15	5

Calculate mean and median for this distribution.   (4+4)

12) Find the Karl Pearson's correlation coefficient for the data given below:

Birth rate	100	104	110	125	130	140	145
Death rate	90	95	98	100	102	115	135

13) A bag contains 7 white and 9 black balls. Two balls are drawn in succession at
    random. What is the probability that the selected balls are (i) both white (ii) both
    black and (iii) one white and one black.   (3+3+2)

14) In a study of the effectiveness of an insecticide against a certain insect a large area of
    land was sprayed. Later the area was examined for live insects by randomly selecting
    squares and counting the number of live insects per square. Past experience has
    shown the average number of live insects per square after spraying to be 0.3. What is
    the probability that selected square will contain (i) exactly one live insect (ii) no live
    insects and (iii) two or more live insects?

15) Before an increase in dosage of anti-biotics on fish reared in a research station, 1000
    out of 1200 were in good condition. After an increase in dosage of anti-biotics, 1300
    fishes were in good condition in a sample of 1400 fishes. Do you think that there has
    been any significant increase in good condition of the fishes after the increase in
    dosage?

16) 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.

17) An experiment was conducted to compare three method of packing a certain foreign food. The criterion was the ascorbic acid content (mg/ 100 gm) after a specified period of time. The following data were obtained.

Packaging method

A	8	10	7	14	11
B	7	5	10	9	9
C	12	9	13	12	14

Do these data provide sufficient evidence at the 5% level of significance to indicate a difference in packing methods?

18) A typing school claims that in a six-week intensive course, it can train students to type on the average, atleast 60 words per minute. A random sample of 15 graduates is given a typing test and the median number of words per minute typed by each of these students is given below. Test the hypothesis that the median typing speed of gradustes is atleast 60 words per minute.

Students	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Words/minute	81	76	53	71	66	59	88	73	80	66	58	70	60	56	55

PART – C

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

19) (i)The lengths of 200 parasites in the human blood were each measured to the nearest micron gives in the following table. Calculate the mean and standard deviation of this distribution. (8)

Length	80-89	70-79	60-69	50-59	40-49	30-39	20-29	10-19
Frequency	2	2	6	20	56	40	42	32

(ii) Y is weight of potassium bromide which will dissolve in 100g of water at X^0 c are given below. Fit the regression equations and estimate weight when $X = 150^0$c. (12)

Heat (^{0}c)	30	50	60	80	100	110	130
Weight(gm)	100	200	300	400	500	600	700

20) (i) A bag A contains 2 white and 3 red balls and a bag B contains 4 white and 5 red balls. One ball is drawn at random from one of the bags and is found to be red. Find the probability that it was drawn from bag (i) A and (ii) B (8)

(ii) Suppose the ages at time of onset of a certain disease are approximately normally distributed with a mean of 11 years and standard deviation of 3 years. A child has just come down with the disease. What is the probability that the child is
(a) between the ages of 8 and 14 years (b) above 10 years of age (c) below 12 years? (12)

21) (i) 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.

(ii) 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. (8+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) types of land and (ii) researchers.

****