UKA TARSADIA UNIVERSITY
Maliba Pharmacy College
B.Pharm 2nd Semester Internal Examination 2012
030020205- Biostatistics

Time: 1:30 to 4:30 p.m.   Max. Marks: **70**
Date: 21/04/2012
Instructions:
  ➢ Question no. **1 is compulsory.**
  ➢ From Q.2 to Q.7 attempt any **four** questions.
  ➢ Make suitable assumption whenever necessary.
  ➢ Figures to the right indicate full marks.

Que.1 (a) Answer the following :(Any six)   **(6)**

  1) Enlist various methods of sampling.
  2) Define Alternative hypothesis.
  3) Explain three dimensional diagrams.
  4) Find arithmetic mean of 15, 20, 25, 19, 12, 12.
  5) What is scattered diagram?
  6) Under what condition chi square test is applicable?
  7) State properties of regression coefficient
  8) Define two-tailed test.

(b) Describe in brief: (any four)   **(8)**
  1) Find standard deviation of 6, 6, 6, 6, 6.
  2) A population consists of 4 units with 3,2,5,7. Write all possible sample size without replacement and find sample mean for each sample.
  3) Distinguish between cluster sampling and stratified sampling.
  4) What is t-test? Give some important application of it.
  5) Explain in brief positive and negative correlation.
  6) Discuss the difference between graphs and diagrams.

Que.2 (a) A population consists of five numbers 3, 4, 7,9,11. Consider the all possible size of two which can be drawn with Replacement from this population. Calculate the standard error (S.E.) of sample mean   **(4)**

 (b) The following data show the blood pressure reduction (in mm Hg) caused in 10 animals by a new antihypertensive compound. 30, 28, 25, 22, 18, 26, 28, 27, 24, 31.test the hypothesis that the blood pressure reduction for the population is 15 Hg. ($t_{9,0.05}$=2.262)   **(5)**

 (C) In cross breeding experiment with plants of certain species 20 off springs were classes with respect to the structure of their leaves as follows: **(5)**

Class	I	II	III	IV	Total
Frequency	21	127	40	52	240

According to theory, the probabilities of off springs in the four classes should be in the ratio 1:9:3:3. Are these data consistent with theory? ($\chi^2_{3,0.05} = 7.815$)

Que. 3 (a) The following tables gives the data of the population having three strata. Find the population mean and variance of stratified sample mean. **(4)**

Strata	Size	$\bar{y_i}$	s_i^2	Ni
1	110	30	10	8
2	40	60	8	7

(b) In laboratory experiment, two random samples gave the following results: **(5)**

Sample	Size	Sample mean	Sum of squares of deviations from the mean
1	10	15	90
2	12	14	108

Test the equality of sample variances at 5% level. **(d.F. = (9, 11), F_T = 2.90).**

(c) Explain the Following. **(5)**

1. Level of Significance and type of Errors.
2. Difference between the sampling with replacement and without replacement.

Que. 4 (a) A sample of 4 observations from a normal population gave the following results. **$\sum x_i = 7$** test the hypothesis that the mean of the population is 2. **(4)**

(b) Find the correlation coefficient between the serum diastolic blood pressure and serum cholesterol levels of the 10 randomly selected data 0f 10 persons**.** **(5)**

Person	1	2	3	4	5	6	7	8	9	10
Cholesterol	307	259	341	317	274	416	267	320	274	336
Diastolic B.P.	80	75	90	74	75	110	70	85	88	78

(c) The competitors in a beauty contest are ranked by three judges in the following order: **(5)**

1st judges	1	6	5	10	3	2	4	9	7	8
2nd judges	3	5	8	4	7	10	2	1	6	9
3rd judges	6	4	9	8	1	2	3	10	5	7

Use the rank correlation coefficient to determine which pair of judged has the nearest approach to common tastes in beauty.

Que.5 (a) Classify the types of sampling methods. What are advantages of sampling? **(4)**

(b) In a sample of 1000 men from one city 750 were found to be smokers in another sample of 1200 men from another city 1000 men were found to be smokers do the data indicate that the two city are significantly different with respect to prevalence of smoking habits among men. (Using difference between two sample proportions at 5% level is **$Z_{0.05} = 1.96$**) **(5)**

(C) The observations of populations are 6,8,12,16,20,22. How many different samples of size 2 without replacement can be taken from it? Preparing a list of the samples, verify the following results**.** **(5)**

1) $E(\bar{y}) = \bar{Y}$ **2)** $E(s^2) = s^2$ **3)** $V(\bar{y}) = (\frac{N-n}{N}) \frac{s^2}{n}$

Que.6 (a) If **b$_{yx}$=-0.3** and **b$_{xy}$=-0.42** then find the correlation coefficient between X and Y.   **(4)**

  (b) Find the correlation coefficient of x and y by Karl Pearson's method from the following data. Using short method of finding correlation coefficient.   **(5)**

X	28	41	40	38	35	33	46	32	36	33
Y	30	34	31	34	30	26	28	31	26	31

  (c) In the following table heights of a father and his son are given (pairs) as follows: **(5)**

Height of Father (Inches)	65	66	67	67	68	69	71	73
Height of Sons (Inches)	67	68	64	68	72	70	69	70

  Find the values of two regression coefficients. Estimate the height of a son when his father's height is 67.5'' Also find the height of a father when the height of his son is 65.0''

Que.7 (a) From the following data (a) the regression line **y on x** (b) the regression line **x on y**.   **(4)**

X	1	2	3	4	5
Y	9	11	5	8	7

  (b) A sample of 400 students has a mean height of 171.38cms. can it be reasonably regarded as a random samples from a large populations with mean 171.17cms and standard deviation 3.3 cms **.**

(Z $_{0.05}$=1.96)   **(5)**

  (C) Blood glucose level of pigeons is compared with rabbits. Apply difference between two sample means to know the significance of difference of blood glucose level of the two using the following data and comment of your result   **(5)**

Sr.No	Blood glucose Level per 100 ml	
	Pigeons	Rabbits
1	200	145
2	186	125
3	176	100
4	184	112
5	170	127
6	172	139
7	170	151
8	163	140
9	176	159
10	173	132