

PARUL UNIVERSITY
FACULTY OF PHARMACY

B.Pharm. Supplementary Winter 2017-18 Examination

Semester: 2

Date: 27/12/2017

Subject Code: 08101155

Time: 10:00 am to 1:00 pm

Subject Name: Applied Biostatistics

Total Marks: 75

Instructions:

1. Figures to the right indicate full marks.
2. Make suitable assumptions wherever necessary.

Q.1 Essay type Questions. (Any 2 out of 3) (10 marks each)**(20)**

1. Calculate Mean , Median and Mode for the following given data:

Class Interval	0-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80
Frequency	5	8	7	12	28	20	10	10

2. Two types of drugs were used on 5 & 7 patients for reducing their weights. Drug A is imported and drug B indigenous. The decrease in the weight after using the drugs for six months was recorded as given below: Is there significant difference in the efficacy of the two drugs? If not, which drug should you buy?(Table value = 2.225)

Drug A	11	13	12	14	10		
Drug B	12	9	8	15	14	9	10

3. A Company's trainees are randomly assigned to groups which are taught a certain industrial inspection procedure by three different methods: At the end of the instructing period they are tested for inspection performance quality. The following are their scores. Use the H - test to determine at the 0.05 level of significance whether the three methods are equally effective.(Table value = 5.991)

Method A	80	83	79	85	90	68	
Method B	82	84	60	72	86	67	91
Method C	93	65	77	78	88		

Q.2 Short Essay type Questions. (Any 7 out of 9) (5 marks each)**(35)**

1. Compute the Correlation Coefficient between X and Y using the following data:

X	2	4	5	6	8	11
Y	18	12	10	8	7	5

2. From the following data Calculate two equations of line of regression. Correlation Coefficient between X and Y is 0.50.

	X	Y
Mean	60	67.5
Standard Deviation	15	13.5

3. The demand for a particular spare part in a factory was found to vary from day to day. In a sample study the following information was obtained: Test the hypothesis that the no. of parts demanded has no association with the days of the week. (Table value = 11.1)

Day	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
No. of parts demanded	1124	1125	1110	1120	1126	1115

4. Find the lines of regression of Y on X if $n = 9$, $\Sigma x = 30.3$, $\Sigma y = 91.1$, $\Sigma xy = 345.09$ and $\Sigma x^2 = 115.11$.
5. A Population is divided into three stratum consisting N_i individuals. From each stratum a sample is drawn. The observation on a certain characteristics X on individuals in the samples are as shown below: Estimate total of Population and Mean of Population

Stratum	N_i	n_i	Values of X
1	30	4	7,6,3,8
2	40	3	12,15,16
3	60	6	3,4,8,2,16,13

6. Two types of chemical solutions A and B were tested for their pH (degree of acidity of the solution). Analysis of 6 samples of A showed a mean pH of 7.52 with a standard deviation of 0.024. Analysis of 5 samples of B showed a mean pH of 7.49 with a standard deviation of 0.032. Using a 0.05 significance level determine whether the two types of solution have different pH values. [Table value = 2.262]
7. In a partially, destroyed laboratory records on the analysis of correlation data, only the following are legible: variance of $x = 9$, Regression equation $8x - 10y + 66 = 0$, $40x - 18y = 214$. Find (a) mean values of x and y , (b) the standard deviation of y .
8. The following Table shows the yields per acre of four different types of a crop grown on lots treated with three different types of fertilizers. Determine at 5% level of significance whether there is significant difference in yields per acre (i) due to fertilizers (ii) due to the types of the crop.

	Crop 1	Crop 2	Crop 3	Crop 4
Fertilizers A	6	4	8	6
Fertilizers B	7	6	6	9
Fertilizers C	8	5	10	9

[Table Value: $F_{T1} = 5.14$, $F_{T2} = 4.76$]

9. A Soap manufacturing company was distributing a particular brand of soap through a large number of retail shops. Before a heavy advertisement campaign the mean sales per week per soap was 140 dozens. After the campaign, a sample of 26 shops was taken and the mean sales was found to be 147 dozens with standard deviation 16. Can you consider the advertisement campaign effective? [Table value = 1.708]

Q.3 Answer in short. (2 marks each)

(20)

- Write the assumptions of Analysis of Variance
- Find r_{xy} from the following data : $n = 10$, $\Sigma (x - \bar{x})(y - \bar{y}) = 1650$, $\sigma_x^2 = 196$, $\sigma_y^2 = 225$
- Define Simple Random Sampling
- A population consists of 5 units with values 2, 1, 4, 6, 5. Write all possible sample of size 2 without replacement and sample mean for each sample.
- Write any three advantages of non-parametric tests.

6. Calculate the mode from the given data:

Marks	0-10	10-20	20-30	30-40	40-50	50-60
No. of students	3	5	7	10	12	6

7. Define: (a) Null Hypothesis (b) Alternative Hypothesis
8. List out all the Sampling Techniques.
9. Define : (1) Simple Correlation , (2) multiple Correlation
10. The amount of Correlation between two variables can be determined by how many methods? List out all the methods.