

Fourth Year Pharm. D. Examination

BIOSTATISTICS AND RESEARCH METHODOLOGY

Paper – 4.4

(USC – 35130)

P. Pages : 3

Time : Three Hours]

[Max. Marks : 70

- Note :** (1) Answer any **Five** questions from **Two** to **Nine** questions.
(2) Question No. **One** is compulsory.
(3) Due credit will be given to neatness and adequate dimensions.
(4) Diagrams and Chemical equations should be given wherever necessary.
(5) Illustrate your answer wherever necessary with the help of neat sketches.
(6) Use of slide rule, logarithmic tables, Steam tables, Mollier's Chart, Drawing instrument, Thermodynamic table for moist air, Psychrometric Charts and Refrigeration charts is permitted.
(7) Use pen of Blue/Black ink/refill only for writing the answer book.
(8) Make use of tables to calculate P value, wherever necessary.
(9) Use electronic calculator for calculation.

1. Given five observations for two variables x and y

xi	1	2	3	4	5
yi	3	7	5	11	14

- (a) Develop a scatter diagram for these data.
(b) What does scatter diagram in part (a) indicates about the relationship between two variables ?
(c) Develop the estimated regression equation by computing values of b_0 and b_1 .
(d) Use estimated regression equation to predict the values of y when
 $x = 4$?

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2. Write short notes on :—

- (a) Range (b) Variance (c) Std. deviation. 11

3. (1) Consider a sample with data values of 53, 55, 70, 58, 64, 57, 53, 69, 57, 68 and 53 :—
Compute :

(a) Mean (b) Median (c) Mode. 11

- (2) Consider the sample data set :

Class	Midpoint	Frequency
3 – 7	5	4
8 – 12	10	7
13 – 17	15	9
18 – 22	20	5

- (a) Compute sample mean
(b) Compute sample variance and std.dev. 11

4. (1) Explain four scales of measurement with examples.
(2) Explain interventional and observational study designs. 11

5. Consider sample data values of 27, 25, 20, 15, 30, 34, 28 and 25, compute :
(a) Range (b) Variance (c) Std. deviation. 11

6. Three drugs received the following ratings from a panel of 15 industry experts :

Product		
A	B	C
50	80	60
62	95	45
75	98	30
48	87	58
65	90	57

Use Kruskal – Wallis test and $\alpha = .05$ to determine whether there is a significant difference in ratings for products. 11

7. What is Research Methodology ? Explain the steps involved in conducting a research ? 11

8. Consider the following set of rankings for a sample of 10 elements :—

Elements	x_i	y_i
1	10	8
2	6	4
3	7	10
4	3	2
5	4	5
6	2	7
7	8	6
8	5	3
9	1	1
10	9	9

Compute Spearman rank correlation coefficient for data At $\alpha = 0.05$. test for significant rank correlation. 11

9. Write a note on SAS and SPSS. Explain in detail. 11

